

***** QUERY RESULTS I *****
 (CLAIM 1, 2 AND 9)

=> d his 142

(FILE 'HCAPLUS' ENTERED AT 11:07:51 ON 03 MAR 2010)

L42 13 S L31 NOT L41

=> d que 142

L2 QUE ABB=ON PLU=ON NEGATIVE? (A) (ACTIVE? OR ELECTRODE)
 OR CATHODE
 L3 QUE ABB=ON PLU=ON POSITIVE? (A) (ACTIVE? OR ELECTRODE)
 OR ANODE
 L4 QUE ABB=ON PLU=ON SULFO? OR SULFA? OR SULFI? OR SULPHO
 ? OR SULPHA? OR SULPHI?
 L5 QUE ABB=ON PLU=ON SULFUR? OR SULPHUR?
 L6 QUE ABB=ON PLU=ON CONTAIN? OR MATERIAL? OR COMPOUND? O
 R SUBSTANC? OR ELEMENT? OR AGENT?
 L7 QUE ABB=ON PLU=ON ELECTROACTIV? OR ELECTRO#(W)ACTIV?
 L9 QUE ABB=ON PLU=ON LI OR LITHIUM
 L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN
 L11 28386 SEA FILE=HCAPLUS ABB=ON PLU=ON L10 (L) (DEV OR USES)/RL
 L12 4390 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 (3A) (L4 OR L5)
 L13 330724 SEA FILE=HCAPLUS ABB=ON PLU=ON (L6 OR L7) (3A) (L4 OR L5)
 L14 32858 SEA FILE=HCAPLUS ABB=ON PLU=ON L3 (3A) (L9 OR L11)
 L17 1664 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND L13
 L18 436 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND L14
 L19 QUE ABB=ON PLU=ON ADDITIVE? OR ADJUVANT? OR AUXILIAR?
 OR MODIF? OR AGENT? OR MEDIUM?
 L20 QUE ABB=ON PLU=ON SOLVENT#
 L21 QUE ABB=ON PLU=ON ETHER# OR CYCLIC (2A) ETHER# OR POLY
 ETHER# OR SULFON?
 L22 89 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND L19
 L24 138 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND (L20 OR L21)
 L26 406800 SEA FILE=HCAPLUS ABB=ON PLU=ON (L4 OR L5) (5A) L6
 L27 195 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 OR L24) AND L26
 L28 QUE ABB=ON PLU=ON NITRATE#
 L29 QUE ABB=ON PLU=ON NITRITE#
 L30 QUE ABB=ON PLU=ON NITRO?
 L31 22 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND ((L28 OR L29 OR L30))
 L32 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7790-69-4/RN
 L33 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7757-79-1/RN
 L34 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7789-18-6/RN
 L35 1 SEA FILE=REGISTRY ABB=ON PLU=ON 10022-31-8/RN
 L36 1 SEA FILE=REGISTRY ABB=ON PLU=ON 6484-52-2/RN
 L37 21493 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L32 OR L33 OR L34 OR L35 OR
 L36)) (L) (MOA OR USES)/RL
 L38 54408 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
 CESIUM OR BARIUM OR AMMONIUM) (W) NITRATE
 L39 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L37
 L40 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L38
 L41 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L39 OR L40
 L42 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 NOT L41

=> d 142 1-13 ibib abs hitstr hitind

L42 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2009:1409374 HCAPLUS Full-text

DOCUMENT NUMBER: 152:15890
 TITLE: Sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof
 INVENTOR(S): Yang, Jun; Wu, Yinglei
 PATENT ASSIGNEE(S): Shanghai Jiao Tong University, Peop. Rep. China
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 13pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101577323	A	20091111	CN 2009-10052891	20090611

PRIORITY APPLN. INFO.: CN 2009-10052891 20090611

AB The title cathode is manufactured by mixing carbon nanotube, sulfur (sublimed sulfur S8) and polyacrylonitrile at a weight ratio of (0.1-0.2):(6-8):1, adding anhydrous ethanol as the dispersing agent, ball-milling for 1-4 h, vacuum-drying at 80-100°C for 1-2 h, heating to 300-320°C under protective atmospheric of argon or nitrogen gas, holding the temperature for sintering for 6-8 h, cooling to obtain a sulfur-based composite active material, mixing the sulfur-based composite active material with cyclodextrin binder (such as α -cyclodextrin, β -cyclodextrin or γ -cyclodextrin) and carbon conductive agent (such as Super P carbon black or acetylene black) at a weight ratio of (7-8):(0.6-1):(0.6-1.5), adding distilled water as the solvent, ultrasonic processing for 10-40 min, heating to 30-50°C, magnetic stirring for 1-4 h to obtain a slurry, coating the slurry on an aluminum foil current collector, vacuum drying at 80-100°C for 2-4 h, and press-molding under 2-3 MPa. When a lithium-sulfur secondary battery constituted by the obtained cathode and a lithium anode is charged or discharged at 0.1 C, the reversible capacity of the sulfur-based composite active material can reach 680 mAh/g, and the discharge capacity after 100 cycles declines less than 10%, compared with that of second cycle.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST sulfur cathode lithium secondary battery

IT Nanotubes
 (carbon; sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof)

IT Secondary batteries
 (lithium; sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof)

IT Molding
 (press; sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof)

IT Ball milling
 Battery cathodes
 Microstructure
 Sintering
 (sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof)

IT Carbon black
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (sulfur-based cathode of lithium-sulfur secondary battery and manufacture method thereof)

IT 7440-44-0, Super P, uses
 RL: PRP (Properties); TEM (Technical or engineered material use); USES

(Uses)

(activated; sulfur-based cathode of lithium
-sulfur secondary battery and manufacture method thereof)

IT 7429-90-5, Aluminum, uses 7585-39-9, β -Cyclodextrin 10016-20-3,
 α -Cyclodextrin 10544-50-0, Sulfur, S8, uses 17465-86-0,
 γ -Cyclodextrin 25014-41-9D, Polyacrylonitrile, cyclized
RL: PRP (Properties); TEM (Technical or engineered material use); USES

(Uses)

(sulfur-based cathode of lithium-
sulfur secondary battery and manufacture method thereof)

L42 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2009:1405745 HCAPLUS Full-text

DOCUMENT NUMBER: 152:41194

TITLE: Mixed positive electrode paste,
and lithium iron phosphate battery using the
same with high specific capacity and specific energy

INVENTOR(S): Zhang, Ronghua

PATENT ASSIGNEE(S): Wenling Hengtai Battery Co., Ltd., Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 20pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101577324	A	20091111	CN 2009-10099008	20090527
PRIORITY APPLN. INFO.:			CN 2009-10099008	20090527

AB The invention relates to mixed pos. electrode paste and lithium iron phosphate battery using the same. The mixed pos. electrode paste is composed of LiFePO_4 0.5-2, $\text{LiCo}_x\text{Ni}_y\text{Mn}_z\text{O}_2$ ($x = 1-5$; $y = 0.6-1.5$; $z = 0.6-1.5$) 0.5-2, conductive agent (acetylene black, flake graphite and/or conductive carbon black) 0.05-0.3, water-based binder (F-105) 0.1-1.0, deionized water 0.5-2, and polar solvent (N-methylpyrrolidone, DMF, di-Et formamide, etc.) 0.05-0.25 weight part. The pos. electrode plate of the lithium iron phosphate battery is aluminum foil coated with the mixed pos. electrode paste. The inventive lithium iron phosphate battery has the advantages of high specific capacity, specific energy and power, low cost, light weight, small size, stable discharge plateau, low self-discharge, no memory effect and wide application.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST mixed cathodic paste lithium iron phosphate battery

IT Battery cathodes

Secondary batteries

(cathode active material mixture paste, and lithium iron
phosphate battery using the same with high specific capacity and
specific energy)

IT Fluoropolymers

RL: PEP (Physical, engineering or chemical process); POF (Polymer in
formulation); TEM (Technical or engineered material use); PROC (Process);
USES (Uses)

(cathode active material mixture paste, and lithium iron
phosphate battery using the same with high specific capacity and
specific energy)

IT Carbon black

RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)

(cathode active material mixture paste, and lithium iron

- phosphate battery using the same with high specific capacity and specific energy)
- IT Alkali metal halides
 RL: TEM (Technical or engineered material use); USES (Uses)
 (lithium halides; cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)
- IT 7631-86-9, F-105, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)
- IT 67-64-1, Acetone, uses 67-68-5, Dimethyl sulfoxide, uses 68-12-2, Dimethyl formamide, uses 109-99-9, Tetrahydrofuran, uses 617-84-5, Diethyl formamide 872-50-4, N-Methyl pyrrolidone, uses 7727-37-9, Nitrogen, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)
- IT 9002-84-0, Polytetrafluoroethylene 9002-89-5, Polyvinyl alcohol
 RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)
- IT 7429-90-5, Aluminium, uses 7440-02-0, Nickel, uses 7782-42-5, Graphite, uses 9004-32-4, Carboxymethyl cellulose sodium 9004-42-6, Carboxyethyl cellulose 15365-14-7, Iron lithium phosphate, LiFePO₄ 1198476-15-1, Cobalt lithium manganese nickel oxide (CoLiMn_{0.8}Ni_{1.5}O₂) 1198476-17-3, Cobalt lithium manganese nickel oxide (Co₂LiMnNi_{1.2}O₂) 1198476-18-4, Cobalt lithium manganese nickel oxide (Co₃LiMn_{1.2}NiO₂) 1198476-20-8, Cobalt lithium manganese nickel oxide (Co₄LiMn_{1.5}Ni_{0.8}O₂) 1198476-22-0, Cobalt lithium manganese nickel oxide (Co₅LiMn_{0.6}Ni_{0.6}O₂)
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)
- IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl carbonate 623-96-1, Dipropyl carbonate 872-36-6, Vinylene carbonate 7791-03-9, Lithium perchlorate 14024-11-4, Lithium chloroaluminate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 56525-42-9, Methyl propyl carbonate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (cathode active material mixture paste, and lithium iron phosphate battery using the same with high specific capacity and specific energy)

L42 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2009:338627 HCAPLUS Full-text
 DOCUMENT NUMBER: 150:333969
 TITLE: Cathode material for primary lithium batteries
 INVENTOR(S): Chang, Sean; Pozin, Michael

PATENT ASSIGNEE(S): The Gillette Company, USA
 SOURCE: U.S. Pat. Appl. Publ., 15 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20090074953	A1	20090319	US 2007-901214	20070914
US 20090070989	A1	20090319	US 2007-982509	20071102
WO 2009036029	A1	20090319	WO 2008-US75809	20080910

W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: US 2007-901214 A2 20070914
 US 2007-982509 A 20071102

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB This primary cell has an anode comprising Li and a cathode comprising FeS₂ and C particles. The electrolyte comprises a Li salt dissolved in a solvent mixture FeS₂ powder and C black is preferably premixed and stored. A cathode slurry is prepared comprising FeS₂, C black, binder and a liquid solvent. The mixture is coated onto a substrate and solvent evaporated leaving a dry cathode coating on the substrate. The cathode coating is then baked in atmospheric under partial vacuum or in an atmosphere of N or inert gas. The anode and cathode can be spirally wound with separator therebetween and inserted into a battery casing with electrolyte then added.

IT 7439-93-2, Lithium, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (cathode material for primary lithium batteries)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

INCL 427074000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery cathode

IT Battery cathodes
 (cathode material for primary lithium batteries)

IT Carbon black
 RL: TEM (Technical or engineered material use); USES (Uses)
 (cathode material for primary lithium batteries)

IT Styrene-butadiene rubber
 RL: TEM (Technical or engineered material use); USES (Uses)

(hydrogenated, block, triblock, binder; cathode material for primary lithium batteries)

IT Air
(in preparation of cathode material for primary lithium batteries)

IT Primary batteries
(lithium; cathode material for primary lithium batteries)

IT Lithium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode material for primary lithium batteries)

IT 694491-73-1D, hydrogenated, block, triblock
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; cathode material for primary lithium batteries)

IT 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses
7782-42-5, Graphite, uses 12068-85-8, Iron sulfide (FeS2)
12597-68-1, Stainless steel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(cathode material for primary lithium batteries)

IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses
7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(in preparation of cathode material for primary lithium batteries)

L42 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2007:1278662 HCAPLUS Full-text
DOCUMENT NUMBER: 147:505493
TITLE: Anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries
INVENTOR(S): Kim, Hee Jung; Lee, Won Sil
PATENT ASSIGNEE(S): Kyungwon Enterprise Co., Ltd., S. Korea
SOURCE: PCT Int. Appl., 63pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007126262	A1	20071108	WO 2007-KR2080	20070427
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW			
RM:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TG, UG, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			

PRIORITY APPLN. INFO.: KR 2006-38047 A 20060427
OTHER SOURCE(S): CASREACT 147:505493; MARPAT 147:505493

AB Disclosed is a novel anion receptor and electrolytes containing the same. A novel anion receptor is an aromatic hydrocarbon compound having an amine substituted with electron withdrawing groups. When the anion receptor is added to the electrolyte, ionic conductivity and cation transference number of

electrolytes are enhanced, thereby increasing the electrochem. stability of alkali metal batteries using the electrolytes. Thus, sulfonylation of 4-hexylaniline with triflic anhydride afforded the anionic receptor 4-[H(CH₂)₆]C₆H₄N(SO₂CF₃)₂ (4-hexylphenyl-TFSI); the latter was mixed with 0.8 g bisphenol A ethoxylate dimethacrylate (crosslinking agent) and lithium triflate and to this mixture was subsequently added dimethoxyphenylacetophenone and the resulting solution coated onto a conductive glass substrate and exposed to UV irradiation, forming the solid polymer electrolyte. The ionic conductivity of the solid polymer electrolyte containing 4-hexylphenyl-TFSI as anion receptor exceeded the comparative electrolyte without anion receptor as temperature increased.

IT 7439-93-2ZD, Lithium, polymer electrolyte complexes
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

L1

IT 7439-93-2, Lithium, uses 7439-93-2D,
 Lithium, intercalation compds. with carbon
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

L1

RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

L1

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT Secondary batteries
 (lithium; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 IT Lithium alloy, base
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

- IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 87187-79-9, Lithium pentafluoropropanoate 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132404-42-3, Lithium tris(trifluoromethanesulfonyl)methanide
 RL: MOA (Modifier or additive use); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 64696-13-5DP, Bisphenol A ethoxylate dimethacrylate homopolymer, lithium complexes, trifluoromethanesulfonimide-containing
 RL: POF (Polymer in formulation); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 7439-93-2DP, Lithium, polymer electrolyte complexes
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compds. with carbon 7440-44-0D, Carbon, intercalation compds. with lithium 7782-42-5, Graphite, uses 7782-42-5D, Graphite, intercalation compds. with lithium
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-79-7, Lithium manganese oxide (LiMnO₂) 12190-79-3, Cobalt lithium oxide (LiCoO₂) 12201-18-2, Lithium molybdenum sulfide (LiMoS₂) 55326-82-4, Lithium titanium sulfide (LiTiS₂) 135573-53-4, Cobalt lithium nickel oxide (Co₀-1LiNi₀-1O₂) 138187-48-1, Lithium vanadium oxide (Li₁.2V₂O₅) 252234-58-5, Lithium magnesium nickel oxide (LiMg₀-1LiNi₀-1O₂) 252234-59-6, Aluminum lithium nickel oxide (Al₀-1LiNi₀-1O₂) 256345-13-8, Lithium vanadium oxide (Li₂.5V₆O₁₃) 600177-48-8, Lithium nickel titanium oxide (LiNi₀-1Ti₀-1O₂) 911110-65-1, Lithium niobium selenide (LiNbSe₃)
 RL: TEM (Technical or engineered material use); USES (Uses)
 (cathode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 128-09-6, N-Chlorosuccinimide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (chlorination agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 506-77-4, Cyanogen chloride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (cyanation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

- same for alkali metal batteries)
- IT 5339-26-4P, 1-(2-Bromoethyl)-4-nitrobenzene
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (dehydrobromination; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, THF, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4, N-Methyl-2-pyrrolidinone, uses 1072-47-5, 4-Methyl-1,3-dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone 51667-26-6, Oxazolidinone
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. solvent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 84-65-1, Anthraquinone 90-94-8, Michler's ketone 93-97-0, Benzoyl benzoate 119-61-9, Benzophenone, uses 120-51-4, Benzyl benzoate 134-85-0, p-Chlorobenzophenone 492-22-8, Thioxanthone 574-09-4, Ethyl benzoin ether 927-07-1, tert-Butyl peroxyphthalate 947-19-3, 1-Hydroxycyclohexyl phenyl ketone 2648-61-5, α,α -Dichloroacetophenone 6175-45-7, α,α -Diethoxyacetophenone 6652-28-4, Isopropyl benzoin ether 6652-29-5, Benzoin phenyl ether 7473-98-5, 2-Hydroxy-2-methyl-1-phenyl-1-propanone 24650-42-8, DMPA 27962-49-8, α -Methylbenzoin ethyl ether 72896-34-5, Chlorothioxanthone 75081-21-9, (Isopropyl)thioxanthone
 RL: CAT (Catalyst use); USES (Uses)
 (photocuring initiator for polymer electrolyte; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 9003-11-6D, Ethylene glycol propylene glycol copolymer, di-Bu ether-terminated 24991-55-7, Polyethylene glycol dimethyl ether 24991-61-5, Polypropylene glycol dimethyl ether 26142-30-3, Polypropylene glycol diglycidyl ether 26403-72-5, Polyethylene glycol diglycidyl ether 31885-97-9, Polyethylene glycol dibutyl ether 53609-62-4, Polyethylene glycol diethyl ether 60314-50-3, Polyethylene glycol dipropyl ether 106392-12-5D, Block polyethylene-polypropylene glycol, di-Bu ether-terminated
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (polymer electrolyte; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 100-13-0P, 4-Nitrostyrene 13556-15-5P, 1,3,5-Triazidobenzene
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
- IT 124-63-0, Methanesulfonyl chloride 358-23-6, Triflic anhydride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 96-50-4, 2-Aminothiazole 109-12-6, 2-Aminopyrimidine 141-86-6,
2,6-Diaminopyridine 328-74-5, 3,5-Bis(trifluoromethyl)aniline
670-96-2, 2-Phenylimidazole 7673-09-8 31230-17-8,
3-Amino-5-methylpyrazole 33228-45-4, 4-Hexylaniline
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonylation, cyanation, chlorination,
trifluoroacetylation; anion receptor comprising aromatic amines
substituted with electron withdrawing groups and electrolyte using the
same for alkali metal batteries)

IT 108-72-5P, 1,3,5-Triaminobenzene 1520-21-4P, 4-Aminostyrene
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(sulfonylation, cyanation, chlorination,
trifluoroacetylation; anion receptor comprising aromatic amines
substituted with electron withdrawing groups and electrolyte using the
same for alkali metal batteries)

IT 108-73-6, 1,3,5-Benzenetriol
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonylation; anion receptor comprising aromatic amines
substituted with electron withdrawing groups and electrolyte using the
same for alkali metal batteries)

IT 68602-57-3, Trifluoroacetyl trifluoromethanesulfonyl anhydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(trifluoroacetylation agent; anion receptor comprising aromatic
amines substituted with electron withdrawing groups and electrolyte
using the same for alkali metal batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
(1 CITINGS)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:252060 HCAPLUS Full-text

DOCUMENT NUMBER: 140:256345

TITLE: Fabrication of cathode active material of a
lithium-sulfur battery

INVENTOR(S): Choi, Soo-Seok; Choi, Yun-Suk; Han, Ji-Seong; Park,
Seung-Hee; Jung, Yong-Ju; Lee, Il-Young

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 25 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20040058246	A1	20040325	US 2003-405237	20030403
US 7029796	B2	20060418		
KR 2004026207	A	20040330	KR 2002-57576	20020923
EP 1427039	A2	20040609	EP 2003-7388	20030402
EP 1427039	A3	20051221		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1485941	A	20040331	CN 2003-123313	20030425
CN 100355123	C	20071212		
JP 2004119367	A	20040415	JP 2003-176947	20030620
PRIORITY APPLN. INFO.:			KR 2002-57576	A 20020923

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A pos. active material of a lithium-sulfur battery includes a sulfur-conductive agent-agglomerated complex in which a conductive agent particle is attached onto a surface of a sulfur particle having an average particle size less than or equal to 7 μm . The sulfur-conductive agent-agglomerated complex is manufactured by mixing a sulfur powder and a conductive agent powder to form a mixture, and milling the mixture

IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); USES (Uses)
 (fabrication of cathode active material of lithium-sulfur battery)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IC ICM H01M004-62
 ICS H01M004-58

INCL 429232000; 429218100; 252182100; 429217000; 429231950

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST cathode active material lithium sulfur battery

IT Polyoxyalkylenes, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (alkylated; fabrication of cathode active material of lithium-sulfur battery)

IT Cork
 Pitch
 (carbon precursor; fabrication of cathode active material of lithium-sulfur battery)

IT Nanotubes
 (carbon; fabrication of cathode active material of lithium-sulfur battery)

IT Telephones
 (cellular; fabrication of cathode active material of lithium-sulfur battery)

IT Clocks
 (digital; fabrication of cathode active material of lithium-sulfur battery)

IT Toys
 (electronic; fabrication of cathode active material of lithium-sulfur battery)

IT Battery cathodes
 (fabrication of cathode active material of lithium-sulfur battery)

IT Carbon black, uses
 Carbon fibers, uses
 Fluoropolymers, uses
 Group IIIA elements
 Group IVA elements
 Polymer blends
 Polyoxyalkylenes, uses
 Transition metals, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (fabrication of cathode active material of lithium-sulfur battery)

IT Secondary batteries

(lithium; fabrication of cathode active material of lithium-sulfur battery)

IT Computers
Television
(portable; fabrication of cathode active material of lithium-sulfur battery)

IT Metals, uses
RL: MOA (Modifier or additive use); USES (Uses)
(powder; fabrication of cathode active material of lithium-sulfur battery)

IT Polyacetylenes, uses
Polyanilines
RL: TEM (Technical or engineered material use); USES (Uses)
(protective layer; fabrication of cathode active material of lithium-sulfur battery)

IT Acoustic devices
(radios, two-way; fabrication of cathode active material of lithium-sulfur battery)

IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(fabrication of cathode active material of lithium-sulfur battery)

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur
, uses 11102-77-5 12798-95-7 18282-10-5, Tin dioxide 22465-17-4,
Titanium nitrate 51398-14-2 51401-38-8 51401-52-6
51401-53-7 53680-59-4 58504-18-0 70246-24-1 77194-67-3
77194-68-4 77194-69-5 97686-54-9
RL: DEV (Device component use); USES (Uses)
(fabrication of cathode active material of lithium-sulfur battery)

IT 7439-88-5, Iridium, uses 7439-92-1, Lead, uses 7439-97-6, Mercury,
uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-04-2,
Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses
7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8,
Ruthenium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses
7440-25-7, Tantalum, uses 7440-26-8, Technetium, uses 7440-31-5, Tin,
uses 7440-33-7, Tungsten, uses 7440-43-9, Cadmium, uses 7440-56-4,
Germanium, uses 7440-57-5, Gold, uses 7440-65-5, Yttrium, uses
7440-67-7, Zirconium, uses 7704-34-9D, Sulfur, compd
. 7782-42-5, Graphite, uses 9002-84-0, Ptfе 9002-86-2, Polyvinyl
chloride 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl
ether 9003-20-7, Polyvinyl acetate 9003-32-1, Polyethyl
acrylate 9003-39-8, Polyvinyl pyrrolidone 9003-47-8, Polyvinylpyridine
9003-53-6, Polystyrene 9011-14-7, Pmma 9011-17-0,
Hexafluoropropylene-vinylidene fluoride copolymer 13463-67-7, Titanium
oxide, uses 15578-32-2, Stannous phosphate 24937-79-9, Pvdф
25014-41-9, Polyacrylonitrile 25322-68-3, Peo 25322-68-3D, Peo,
alkylated 58799-80-7, Cobalt lanthanum strontium oxide colasro3
141067-82-5, Lanthanum manganese strontium oxide lamnsro3
RL: MOA (Modifier or additive use); USES (Uses)
(fabrication of cathode active material of lithium-sulfur battery)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(nanotubes; fabrication of cathode active material of lithium-sulfur battery)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5, Manganese,
uses 7440-02-0, Nickel, uses 7440-20-2, Scandium, uses 7440-32-6,
Titanium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses
7440-50-8, Copper, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc,

uses

RL: MOA (Modifier or additive use); USES (Uses)
 (powder; fabrication of cathode active material of
 lithium-sulfur battery)

IT 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7440-55-3, Gallium,
 uses 7440-70-2, Calcium, uses 10377-52-3, Lithium phosphate
 12627-14-4, Lithium silicate 12676-27-6 25067-58-7,
 Polyacetylene 25190-62-9, Poly(p-phenylene) 25233-30-1, Polyaniline
 25233-34-5, Polythiophene 26009-24-5, Poly(p-phenylene vinylene)
 28774-98-3, Poly(naphthalene-2,6-diyl) 30604-81-0, Polypyrrole
 114239-80-4, Poly(perinaphthalene) 236388-73-1, Lithium
 silicide sulfide 236388-74-2, Lithium boride sulfide
 236388-75-3, Aluminum lithium sulfide 355408-23-0,
 lithium nitride phosphide

RL: TEM (Technical or engineered material use); USES (Uses)
 (protective layer; fabrication of cathode active material of
 lithium-sulfur battery)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD
 (2 CITINGS)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:119840 HCAPLUS Full-text

DOCUMENT NUMBER: 140:149223

TITLE: Method for producing cathode for
 lithium-sulfur battery

INVENTOR(S): Hwang, Duck-chul; Park, Zin; Lee, Jae-woan

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 11 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20040029014	A1	20040212	US 2003-634748	20030806
KR 2004013585	A	20040214	KR 2002-46581	20020807
JP 2004071566	A	20040304	JP 2003-283959	20030731
CN 1495937	A	20040512	CN 2003-127272	20030807
CN 1331252	C	20070808		

PRIORITY APPLN. INFO.: KR 2002-46581 A 20020807

AB The invention concerns a pos. electrode of a lithium-sulfur battery, a method
 of producing the same, and a lithium-sulfur battery include, as the pos.
 electrode, a current collector, a pos. active material layer on the current
 collector, and a polymer layer on the pos. active material on the current
 collector.

IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)
 (method for producing cathode for lithium-
 sulfur battery)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

IC ICM H01M002-16
ICS H01M004-60; H01M004-58
INCL 429246000; 429251000; 429252000; 429218100; 429213000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST Section cross-reference(s): 38
ST cathode lithium sulfur battery
IT Polyurethanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(acrylates, ethoxylated; method for producing cathode for
lithium-sulfur battery)
IT Styrene-butadiene rubber, uses
RL: DEV (Device component use); USES (Uses)
(hydrogenated, block, triblock, sulfonated; method for
producing cathode for lithium-sulfur
battery)
IT Primary batteries
(lithium; method for producing cathode for
lithium-sulfur battery)
IT Battery cathodes
(method for producing cathode for lithium-
sulfur battery)
IT ABS rubber
Fluoropolymers, uses
Nitrile rubber, uses
Polyolefins
Polyoxyalkylenes, uses
Polyvinyl butyrals
Styrene-butadiene rubber, uses
RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-
sulfur battery)
IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-
sulfur battery)
IT 9003-56-9
RL: DEV (Device component use); USES (Uses)
(ABS rubber, method for producing cathode for lithium
-sulfur battery)
IT 1344-28-1, Alumina, uses 7631-86-9, Colloidal silica, uses
RL: DEV (Device component use); USES (Uses)
(colloidal; method for producing cathode for lithium
-sulfur battery)
IT 10344-93-1D, Acrylate, alkyl derivative
RL: TEM (Technical or engineered material use); USES (Uses)
(ethoxylated; method for producing cathode for
lithium-sulfur battery)
IT 110-71-4 111-96-6, Diglyme 126-33-0, Sulfolane 646-06-0,
1,3-Dioxolane 1314-23-4, Zirconium oxide, uses 1332-29-2, Tin oxide
1332-37-2, Iron oxide, uses 7439-93-2, Lithium, uses
7440-44-0, Carbon, uses 7704-34-9, Sulfur, uses 7704-34-9D,
Sulfur, organic compound 7791-03-9, Lithium
perchlorate 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl
ether 9003-20-7, Polyvinyl acetate 9003-22-9, Vinyl
acetate-vinyl chloride copolymer 9003-39-8, Polyvinylpyrrolidone
9004-35-7, Cellulose acetate 9010-88-2, Ethyl
acrylate-methylmethacrylate copolymer 9011-17-0,
Hexafluoropropylene-vinylidene fluoride copolymer 11075-35-7, Vanadium

titanium oxide 11099-11-9, Vanadium oxide 11126-12-8, Iron sulfide 12673-92-6, Titanium sulfide 12789-64-9, Iron titanate 13463-67-7, Titanium oxide, uses 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 24937-79-9, PVDF 25014-41-9, Polyacrylonitrile 25086-89-9, Vinyl acetate-vinylpyrrolidone copolymer 25322-68-3, PEO 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 69822-67-9, Poly(carbon sulfide) 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide 130038-50-5, 2-Propenoic acid, 2-methyl-, ion(1-) homopolymer, uses 413569-08-1, 2-Propenoic acid, ion(1-) homopolymer, uses

RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-sulfur battery)

IT 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-24-6, Strontium, uses 7440-28-0, Thallium, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-56-4, Germanium, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7553-56-2, Iodine, uses 7726-95-6, Bromine, uses

RL: TEM (Technical or engineered material use); USES (Uses)
(method for producing cathode for lithium-sulfur battery)

IT 9003-18-3

RL: DEV (Device component use); USES (Uses)
(nitrile rubber, method for producing cathode for lithium-sulfur battery)

IT 64401-02-1 84170-28-5

RL: TEM (Technical or engineered material use); USES (Uses)
(protective coating containing; method for producing cathode for lithium-sulfur battery)

IT 7429-90-5, Aluminum, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses 7723-14-0, Phosphorus, uses 7727-37-9, Nitrogen, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses 7782-50-5, Chlorine, uses 26570-48-9, Polyethylene glycol diacrylate 52496-08-9, Polypropylene glycol diacrylate

RL: TEM (Technical or engineered material use); USES (Uses)
(protective coating; method for producing cathode for lithium-sulfur battery)

IT 106107-54-4

RL: DEV (Device component use); USES (Uses)
(styrene-butadiene rubber, hydrogenated, block, triblock, sulfonated; method for producing cathode for lithium-sulfur battery)

IT 9003-55-8

RL: DEV (Device component use); USES (Uses)
(styrene-butadiene rubber, method for producing cathode for lithium-sulfur battery)

IT 694491-73-1D, hydrogenated, block, triblock

RL: DEV (Device component use); USES (Uses)
(styrene-butadiene rubber, sulfonated; method for producing cathode for lithium-sulfur battery)

L42 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2003:609927 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 139:152326

TITLE: Tetraketopiperazine unit-containing compound as an active material in batteries

INVENTOR(S): Umemoto, Teruo

PATENT ASSIGNEE(S): IM & T Research, Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 34 pp.

DOCUMENT TYPE: CODEN: USXXCO
 LANGUAGE: Patent
 FAMILY ACC. NUM. COUNT: English
 PATENT INFORMATION: 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030148188	A1	20030807	US 2001-28064	20011220
US 6737193	B2	20040518		

PRIORITY APPLN. INFO.: US 2001-28064 20011220

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 139:152326

AB Compd. containing at least one tetraketopiperazine-1,4-diyl unit are disclosed as active materials in the pos. electrodes of batteries. Novel methods for preparing the tetraketopiperazine unit-containing compds. include: (i) reacting an oxalyl halide and an oxamide, and adding water or an aqueous alkali solution to the reaction mixture, (ii) reacting an oxalyl halide and a silylamine, (iii) reacting an oximidyl halide and an amine, (iv) reacting an oxalyl halide and a silylamine, and reacting with an amine, (v) reacting an oxalyl halide and a dioxamide, (vi) reacting an oximidyl halide and a diamine, and (vii) reacting an oxalyl halide and a silylamine, and reacting with a diamine. A novel method for preparing an oximidyl halide is also disclosed. Thus, e.g., 3.3 g oxalyl chloride was added to 2.33 g N,N'-dimethyloxamide in dry MeCN at 60°; the reaction mixture was stirred for 1 h and 0.72 mL water was added dropwise over 15 min followed by continued stirring for 1.5 h at 60°; ppts. were collected after cooling to 1°, affording N,N'-dimethyl-2,3,5,6-tetraketopiperazine in 81% yield (vs. 52% without addition of water). A Li battery having N,N'-dimethyl-2,3,5,6-tetraketopiperazine as an active material for the pos. electrode showed impressive flatness of discharge curve, electromotive force (3.2 V), discharge capacity (289 mAh/g until 1.3 V), and discharge energy (647 Wh/kg until 1.3 V). With a theor. capacity of 315 mAh/g based on two electrons/mol., the effectiveness of the active material was 92%.

IC ICM H01M006-18

INCL 429310000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 28, 38

IT Halides

Oxides (inorganic), uses

Sulfides, uses

RL: MOA (Modifier or additive use); USES (Uses)

(cathode material; preparation of tetraketopiperazine unit-containing compds. as an active material in the pos. electrodes of batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)

IT Battery cathodes

(preparation of tetraketopiperazine unit-containing compds. as an active material in the pos. electrodes of batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)

IT 62-53-3, Aniline, reactions 79-37-8, Oxalyl chloride 88-74-4, 2-Nitroaniline 102-28-3, 3-(Acetylamino)aniline 106-50-3, p-Phenylenediamine, reactions 107-15-3, 1,2-Diaminoethane, reactions 109-76-2, 1,3-Diaminopropane 110-60-1, 1,4-Diaminobutane 615-35-0, N,N'-Dimethyloxamide 615-84-9, N,N'-Diethyloxamide 920-68-3, Heptamethyldisilazane 999-97-3, Hexamethyldisilazane 572905-65-8
 RL: RCT (Reactant); RACT (Reactant or reagent)

(heterocyclization; preparation of tetraketopiperazine unit-containing compds.

as an active material in the pos. electrodes of

- batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)
- IT 572905-59-0P, N-Methyloximidyl chloride
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (heterocyclization; preparation of tetraketopiperazine unit-containing compds.
 as an active material in the pos. electrodes of
 batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)
- IT 1305-62-0, Calcium hydroxide, reactions 1309-42-8, Magnesium hydroxide
 1310-58-3, Potassium hydroxide, reactions 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, reactions 1310-82-3, Rubidium hydroxide 7732-18-5, Water, reactions 17194-00-2, Barium hydroxide 21351-79-1, Cesium hydroxide
 RL: RGT (Reagent); RACT (Reactant or reagent)
 (neutralizing agent; preparation of tetraketopiperazine unit-containing compds. as an active material in the pos. electrodes of batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)
- IT 35141-14-1P, N,N'-Dimethyl-2,3,5,6-tetraketopiperazine 49715-78-8P, 2,3,5,6-Tetraketopiperazine 64481-51-2P, N-Methyl-N'-phenyl-2,3,5,6-tetraketopiperazine 99687-11-3P, N,N'-Diethyl-2,3,5,6-tetraketopiperazine 572905-61-4P, N-Methyl-N'-(2-nitrophenyl)-2,3,5,6-tetraketopiperazine 572905-63-6P
 572905-67-0P 572905-69-2P 572905-71-6P 572905-73-8P 572910-35-1P 572910-36-2P 572910-37-3P
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (preparation of tetraketopiperazine unit-containing compds. as an active material in the pos. electrodes of batteries by heterocyclization of oxamides with oxalyl halides in presence of neutralizing agents)
- L42 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2003:458493 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 139:216878
 TITLE: Effect of Multiwalled Carbon Nanotubes on Electrochemical Properties of Lithium/Sulfur Rechargeable Batteries
 AUTHOR(S): Han, Sang-Cheol; Song, Min-Sang; Lee, Ho; Kim, Hyun-Seok; Ahn, Hyo-Jun; Lee, Jai-Young
 CORPORATE SOURCE: Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon, 305-701, S. Korea
 SOURCE: Journal of the Electrochemical Society (2003), 150(7), A889-A893
 CODEN: JESOA; ISSN: 0013-4651
 PUBLISHER: Electrochemical Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English
- AB To bestow high electronic conductivity and prevent dissoln. of sulfur into the electrolyte, multi-walled carbon nanotubes (MWNTs) were prepared by thermal CVD as an inactive additive material for elemental sulfur pos. electrodes for lithium/sulfur rechargeable batteries. The initial discharge capacity of elemental sulfur pos. electrode with MWNT is 485 mAh/g sulfur at 2.0 V vs. Li/Li+. The cycle life and rate capability of sulfur cathode is increased with addition of MWNT. The MWNT shows a vital role on polysulfide adsorption and is a good elec. conductor for a sulfur cathode.
- IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)
 (foil, anode; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

LI

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49, 76

ST multiwalled carbon nanotube cond lithium sulfur rechargeable battery CVD

IT Fluoropolymers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (blend with sulfur and acetylene black; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Carbon black, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (blend with sulfur and polyvinylidene difluoride; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Nanotubes
 (carbon, multi-walled; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Vapor deposition process
 (chemical; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Polysulfides
 RL: FMU (Formation, unclassified); NUU (Other use, unclassified); FORM (Formation, nonpreparative); USES (Uses)
 (effect of MWNTs on retention of lithium polysulfides at electrodes of lithium sulfur battery)

IT Battery cathodes
 Cyclic voltammetry
 Electric conductivity
 Electric current-potential relationship
 (effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Secondary batteries
 (lithium/sulfur; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT Thermal decomposition
 (of methane; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT 7440-44-0P, Carbon, uses
 RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (MWNTs; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)

IT 7704-34-9, Sulfur, uses

- RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(blend with acetylene black and polyvinylidene difluoride; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 24937-79-9
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(blend with sulfur and acetylene black; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 1333-74-0, Hydrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst reduction and MWNT feed gas; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 122327-06-4P, Magnesium nickel oxide (Mg_{0.6}Ni_{0.4}O)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 74-82-8, Methane, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 77-92-9, Citric acid, reactions 13446-18-9, Magnesium nitrate, hexahydrate 13478-00-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 143-24-8, Tetraglyme 90076-65-6, Lithium bis(trifluoromethane sulfonyl)imide
RL: DEV (Device component use); USES (Uses)
(electrolyte; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(foil, anode; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); USES (Uses)
(foil, cathode substrate; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- IT 9003-07-0, Celgard 2200
RL: DEV (Device component use); USES (Uses)
(porous, separator; effect of multi-walled carbon nanotubes on electrochem. properties of lithium/sulfur rechargeable batteries)
- OS.CITING REF COUNT: 18 THERE ARE 18 CAPLUS RECORDS THAT CITE THIS RECORD (18 CITINGS)
- REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

DOCUMENT NUMBER: 138:15307
 TITLE: Lithium-sulfur batteries with good cycle life characteristics
 INVENTOR(S): Choi, Soo Seok; Choi, Yunsuk; Jung, Yongju; Lee, Jaewoan; Hwang, Duck Chul; Kim, Joo Soak; Park, Zin; Kim, Seok; Han, Ji Sung
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
 SOURCE: U.S. Pat. Appl. Publ., 16 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20020192557	A1	20021219	US 2002-72907	20020212
US 7250233	B2	20070731		
KR 2002092029	A	20021211	KR 2001-30878	20010601
JP 2002367678	A	20021220	JP 2002-61349	20020307
CN 1389948	A	20030108	CN 2002-116133	20020419
CN 100346523	C	20071031		

PRIORITY APPLN. INFO.: KR 2001-30878 A 20010601

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A lithium-sulfur battery having a pos. electrode including a pos. active material including an active sulfur, where the pos. electrode comprises an electron-conductive path and an ion-conductive path, and includes active pores of the average size of up to 20 μ m having both electron-conductive and ion-conductive properties, and are filled with the active sulfur during an electrochem. reaction of the battery.

IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); USES (Uses)
 (lithium-sulfur batteries with good cycle life characteristics)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IC ICM H01M004-62

INCL 429232000; 429231950; 429218100; 429212000; 427058000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium sulfur rechargeable battery

IT Fluoropolymers, uses
 Polyoxoalkylenes, uses
 Polyvinyl butyrals
 RL: MOA (Modifier or additive use); USES (Uses)
 (binder; lithium-sulfur batteries with good cycle life characteristics)

IT Ceramics
 (electrolyte; lithium-sulfur batteries with good cycle life characteristics)

IT Glass, uses
 RL: DEV (Device component use); USES (Uses)
 (electrolyte; lithium-sulfur batteries with good cycle life characteristics)

- IT Battery anodes
Battery cathodes
Battery electrolytes
Polymer electrolytes
(lithium-sulfur batteries with good cycle life characteristics)
- IT Crown ethers
Sulfones
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT Secondary batteries
(lithium; lithium-sulfur batteries with good cycle life characteristics)
- IT Ligroine
RL: DEV (Device component use); USES (Uses)
(solvent; lithium-sulfur batteries with good cycle life characteristics)
- IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 9002-84-0, Ptfе 9002-86-2, Polyvinyl chloride 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl ether 9003-20-7, Polyvinyl acetate 9003-22-9, Vinyl acetate-vinyl chloride copolymer 9003-32-1, Polyethyl acrylate 9003-47-8, Polyvinylpyridine 9003-53-6, Polystyrene 9004-35-7, Cellulose acetate 9010-88-2, Ethyl acrylate-methyl methacrylate copolymer 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Polyvinylidene fluoride 25014-41-9, Polyacrylonitrile 25086-89-9 25322-68-3, Pео
RL: MOA (Modifier or additive use); USES (Uses)
(binder; lithium-sulfur batteries with good cycle life characteristics)
- IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 33454-82-9, Lithium triflate
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 115672-18-9P, Lithium sulfide (Li₂(S₈))
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 67-68-5, Dmsо, uses 67-71-0, Dimethyl sulfone 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 96-48-0, Butyrolactone 107-21-1, Ethylene glycol, uses 109-99-9, Thf, uses 110-60-1, Tetramethylene diamine 110-71-4, Glyme 110-86-1, Pyridine, uses 110-95-2, Tetramethyl propylene diamine 111-96-6, Diglyme 126-33-0, Sulfolane 126-73-8, Tributyl phosphate, uses 127-19-5, n,n-Dimethyl acetamide 143-24-8, Tetraglyme 512-56-1, Trimethyl phosphate 617-84-5, n,n-Diethylformamide 632-22-4, Tetramethyl urea 646-06-0, Dioxolane 680-31-9, Hexamethylphosphoramide, uses 685-91-6, n,n-Diethyl acetamide 872-50-4, n-Methylpyrrolidone, uses 1330-20-7, Xylene, uses 1493-13-6, Trifluoromethanesulfonic acid 2832-49-7, n,n,n',n'-Tetraethyl sulfamide 7446-09-5, Sulfur dioxide, uses 7637-07-2, uses 9080-49-3, Polysulfide
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)

IT 78-51-3 84-66-2, Diethyl phthalate 84-74-2, Dibutyl phthalate 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 131-11-3, Dimethyl phthalate 2459-10-1, Trimethyl trimellitate
 RL: MOA (Modifier or additive use); USES (Uses)
 (plasticizer; lithium-sulfur batteries with good cycle life characteristics)

IT 60-29-7, Ether, uses 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 71-55-6, Trichloroethane 75-09-2, Dichloromethane, uses 79-01-6, Trichloroethylene, uses 110-54-3, Hexane, uses 110-82-7, Cyclohexane, uses
 RL: DEV (Device component use); USES (Uses)
 (solvent; lithium-sulfur batteries with good cycle life characteristics)

OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2002:916834 HCAPLUS Full-text

DOCUMENT NUMBER: 138:224093

TITLE: Electrode characteristics of manganese oxides prepared by reduction method

AUTHOR(S): Yagi, H.; Ichikawa, T.; Hirano, A.; Imanishi, N.; Ogawa, S.; Takeda, Y.

CORPORATE SOURCE: Department of Chemistry, Mie University, Mie, Tsu, 514-8507, Japan

SOURCE: Solid State Ionics (2002), 154-155, 273-278
 CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The electrode properties of manganese dioxides prepared by the reduction with various reagents were examined. The particle size and morphol. depended on reducing agents. Some samples obtained were aggregated round particles of submicron order and the others were fine needle-like shape of a few nanometers in width and several tens of nanometers in length. The former showed capacity .apprx.200 mA-h/g, while the latter showed high capacity of 500 mA-h/g for open-circuit voltage measurements until 1 V (vs. Li). The cell assembled with Li anode showed a good cycle performance in the range of 2.0-3.9 V with a capacity of 150 mA-h/g.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST manganese dioxide prepn reducing agent; cathode manganese dioxide lithium battery

IT Secondary batteries
 (lithium-manganese dioxide; cathode characteristics of manganese dioxides prepared by reduction of potassium permanganate with various reagents for batteries)

IT 64-18-6, Formic acid, processes 141-53-7, Sodium formate 7631-90-5, Sodium bisulfite 7632-00-0, Sodium nitrite 7681-53-0, Sodium hydrogen phosphite (NaH2PO2) 7722-84-1, Hydrogen peroxide, processes 7757-83-7, Sodium sulfite 7758-09-0, Potassium nitrate 7782-77-6, Nitrous acid 10117-38-1, Potassium sulfite 13598-36-2, Phosphonic acid
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (reducing agent; cathode characteristics of manganese dioxides prepared by reduction of potassium permanganate with various reagents for batteries)

OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD

(5 CITINGS)
 REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 1997:411030 HCAPLUS Full-text
 DOCUMENT NUMBER: 127:97541
 ORIGINAL REFERENCE NO.: 127:18745a,18748a
 TITLE: Calcined coke containing nitrogen
 and sulfur for cathodes of
 electrochemical cells having lithium
 anode
 INVENTOR(S): Lewis, Irwin Charles; Greinke, Ronald Alfred
 PATENT ASSIGNEE(S): Ucar Carbon Technology Corporation, USA
 SOURCE: U.S., 12 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 5639576	A	19970617	US 1996-654661	19960529
DE 19703954	A1	19971204	DE 1997-19703954	19970203
DE 19703954	C2	20000525		
JP 09320571	A	19971212	JP 1997-22949	19970205
			US 1996-654661	A 19960529

PRIORITY APPLN. INFO.:

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The cathodes suitable for electrochem. cells with an alkali metal (especially Li) anode are manufactured from: (a) calcined coke powder containing ≥ 0.5 N and ≥ 1.0 weight% S heteroatoms, and having average particle size of 2-40 μ m with the maximum size ≤ 50 μ m; (b) the binder typically selected from poly(vinylidene fluoride) or ethylene-propylene-diene terpolymer; and (c) optional elec. conductive C. The calcined coke cathodes typically contain 1-2 N and 1-3 weight% S from the starting pitch and other raw materials. The bonded coke electrodes are also suitable as the anodes used with: (a) MoS₂, CoO₂, or similar bonded cathodes; and (b) electrolyte with organic aprotic solvent or a polymer, as well as LiAsF₆ or a similar elec. conductive Li salt. The bonded-coke electrodes contain reversibly intercalated Li at the capacity $\leq 70\%$ of nominal LiC₆ limit, vs. 20% when the coke contains only 0.21 N and 0.57 weight% S.

IT 7439-93-2, Lithium, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (intercalated; calcined coke containing intercalated lithium for electrodes of electrochem. cells)

RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

LI

IC ICM H01M004-38
 INCL 429218000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 51

ST electrochem cell lithium doped coke electrode; coke cathode
electrochem cell lithium anode; sulfide
cathode cell bonded coke anode

IT Cathodes
(coke-based; calcined coke containing nitrogen and
sulfur for bonded electrodes of electrochem. cells)

IT Electrodes
(coke; calcined coke containing nitrogen and
sulfur for electrodes of electrochem. cells)

IT Coke
RL: DEV (Device component use); USES (Uses)
(doped; calcined coke containing nitrogen and
sulfur for electrodes of electrochem. cells)

IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(electrochem. cells with; bonded electrodes for electrochem. cells with
organic aprotic solvent and lithium salt)

IT Anodes
(lithium; calcined coke containing nitrogen
and sulfur for electrodes of electrochem. cells with
lithium anodes)

IT 7704-34-9, Sulfur, uses 7727-37-9, Nitrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(coke doped with; calcined coke containing nitrogen and
sulfur for electrodes of electrochem. cells)

IT 12057-17-9, Lithium manganate (LiMn2O4) 12190-79-3, Cobalt
lithium oxide (LiCoO2) 25014-41-9, Polyacrylonitrile
25322-68-3, Polyethylene oxide 29935-35-1, Lithium
hexafluoroarsenate
RL: MOA (Modifier or additive use); USES (Uses)
(electrochem. cells with; bonded electrodes for electrochem. cells with
organic aprotic solvent and lithium salt)

IT 1313-13-9, Manganese dioxide, uses 1317-33-5, Molybdenum sulfide (MoS2),
uses 7782-42-5, Graphite, uses 12017-00-4, Cobalt oxide (CoO2)
12037-42-2, Vanadium oxide (V6O13)
RL: DEV (Device component use); USES (Uses)
(electrodes with; bonded electrodes for electrochem. cells with organic
aprotic solvent and lithium salt)

IT 7439-93-2, Lithium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(intercalated; calcined coke containing intercalated lithium for
electrodes of electrochem. cells)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
(1 CITINGS)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L42 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 1993:584774 HCAPLUS Full-text
DOCUMENT NUMBER: 119:184774
ORIGINAL REFERENCE NO.: 119:32955a,32958a
TITLE: Lithium secondary battery
INVENTOR(S): Fujimoto, Masahisa; Yoshinaga, Noriyuki; Ueno, Koji;
Furukawa, Nobuhiro; Nohma, Toshiyuki; Takahashi,
Masatoshi
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
SOURCE: Eur. Pat. Appl., 60 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 541889	A1	19930519	EP 1992-103986	19920309
EP 541889	B1	19980909		
R: CH, DE, FR, GB, LI				
JP 05013088	A	19930122	JP 1991-325778	19911210
JP 3369583	B2	20030120		
JP 11224675	A	19990817	JP 1998-340492	19911210
JP 05211070	A	19930820	JP 1991-360254	19911227
JP 3229635	B2	20011119		
JP 2002075451	A	20020315	JP 2001-213908	19911227
JP 3403184	B2	20030506		
JP 2002075452	A	20020315	JP 2001-213909	19911227
JP 3408250	B2	20030519		
CA 2064965	A1	19930513	CA 1992-2064965	19920402
CA 2064965	C	19970603		
JP 2002075448	A	20020315	JP 2001-213905	20010713
JP 3374135	B2	20030204		
JP 2002075449	A	20020315	JP 2001-213906	20010713
JP 3374136	B2	20030204		
JP 2002075450	A	20020315	JP 2001-213907	20010713
JP 3374137	B2	20030204		
PRIORITY APPLN. INFO.:				
			JP 1991-295835	A 19911112
			JP 1991-319200	A 19911203
			JP 1991-325778	A 19911210
			JP 1991-360254	A 19911227
			JP 1990-401667	A1 19901212
AB	The battery includes a cathode of a Li-intercalatable compound, an anode of a carbonaceous material comprising mainly or only graphite, a separator, and an electrolyte of a Li salt in a solvent comprising at least one cyclic compound such as ethylene carbonate, ethylene thiocarbonate, γ -thiobutyrolactone, α -pyrrolidone, γ -butyrolactone, propylene carbonate, 1,2-butylene carbonate, etc. The graphite has an average particle diameter 1-30 μ m, spacing of (002) planes 3.35-3.40 \AA , crystallite size in c direction ≥ 150 \AA , sp. surface area 0.5-50 m ² /g, and true d. 1.9-2.3 g/cm ³ . The Li-intercalatable compound is Li _x MO ₂ or Li _y M ₂ O ₄ , where M is a transition element, x ≤ 1 and y ≤ 2 ; metal oxide-, anion-, or halide-intercalated graphite; or a conductive polymer containing a dopant.			
IC	ICM H01M004-58			
	ICS H01M010-40			
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)			
	Section cross-reference(s): 38			
ST	lithium battery electrolyte solvent; electrolyte org lithium battery; graphite anode lithium battery; anode graphite lithium battery; transition metal lithium oxide cathode; polymer lithium intercalatable battery cathode			
IT	Battery electrolytes (lithium salt in at least one cyclic organic compound)			
IT	Batteries, secondary (lithium, high-performance and long cycle-life)			
IT	Carbon fibers, compounds			
	RL: USES (Uses) (graphite, intercalation compds., with nitrate or sulfate, lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)			

- IT 7782-42-5, Graphite, uses
RL: USES (Uses)
(anodes, in high-performance organic-electrolyte lithium batteries)
- IT 7440-44-0 7782-42-5
RL: USES (Uses)
(carbon fibers, graphite, intercalation compds., with nitrate or sulfate, lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-87-7D, Lithium vanadium oxide (LiVO₂), graphite intercalated with 12190-79-3, Cobalt lithium oxide (CoLiO₂) 15060-59-0D, Lithium vanadium oxide (LiVO₃), graphite intercalated with 118321-27-0D, Lithium molybdenum oxide (Li_{0.3}MoO₃), graphite intercalated with
RL: USES (Uses)
(cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 25233-30-1, Polyaniline 25233-34-5, Polythiophene 25718-66-5 30604-81-0, Polypyrrole 51555-21-6, Polycarbazole
RL: USES (Uses)
(doped, lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 96-48-0, γ -Butyrolactone 96-49-1, 1,3-Dioxolan-2-one 108-29-2, γ -Valerolactone 108-32-7 109-99-9, uses 110-01-0, Thiolane 123-75-1, Pyrrolidine, uses 504-70-1, Pyrazolidine 616-45-5, α -Pyrrolidone 695-06-7, γ -Ethyl- γ -butyrolactone 1003-10-7, γ -Thiobutyrolactone 1003-46-9, 2-Methylsulfolane 1679-49-8, β -Methyl- γ -butyrolactone 4437-70-1, 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate 7791-03-9, Lithium perchlorate 10178-59-3 13423-15-9, 3-Methyltetrahydrofuran 14283-07-9, Lithium tetrafluoroborate 20628-59-5, Ethylene thiocarbonate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate 89791-49-1 90076-65-6 131651-65-5
RL: USES (Uses)
(electrolyte containing, for high-performance and long cycle-life lithium batteries)
- IT 1313-27-5D, Molybdenum oxide (MoO₃), graphite intercalated with 1314-35-8D, Tungsten oxide (WO₃), graphite intercalated with 1314-62-1D, Vanadium pentoxide, graphite intercalated with 1333-82-0D, Chromium oxide (CrO₃), graphite intercalated with 7783-63-3D, graphite intercalated with 11115-86-9, Graphite iron chloride 11129-36-5 12036-21-4D, Vanadium oxide (VO₂), graphite intercalated with 12039-13-3D, Titanium disulfide, graphite intercalated with 12067-45-7D, Titanium diselenide, graphite intercalated with 12166-28-8D, Vanadium disulfide, graphite intercalated with 12299-51-3D, Vanadium diselenide, graphite intercalated with 12672-50-3, Graphite cobalt chloride 12707-64-1 14477-72-6D, Trifluoroacetate, graphite intercalated with 14797-73-0D, Perchlorate, graphite intercalated with 14844-07-6D, Dithionite, graphite intercalated with 14874-70-5D, Tetrafluoroborate, graphite intercalated with 16919-18-9D, Hexafluorophosphate, graphite intercalated with 18868-43-4D, Molybdenum oxide (MoO₂), graphite intercalated with 37181-39-8D, Trifluoromethanesulfonate, graphite intercalated with 37210-78-9 37348-79-1, Graphite iodine chloride 39345-60-3D, graphite intercalated with 39383-90-9 51358-33-9D, graphite intercalated with 58572-93-3 61008-50-2, Graphite magnesium chloride 61462-06-4, Graphite manganese chloride 61811-49-2, Graphite

iodine bromide 63943-01-1D, graphite intercalated with 89172-94-1
 89820-60-0 106496-65-5, Molybdenum potassium oxide (MoK0.303)
 RL: USES (Uses)
 (lithium-intercalatable, cathodes, in high-performance
 organic-electrolyte lithium batteries)
 IT 7782-42-5, Graphite, uses
 RL: USES (Uses)
 (lithium-intercalatable, cathodes, in high-performance
 organic-electrolyte lithium batteries)
 OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD
 (4 CITINGS)

L42 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 1978:107897 HCAPLUS Full-text
 DOCUMENT NUMBER: 88:107897
 ORIGINAL REFERENCE NO.: 88:16907a,16910a
 TITLE: Alkali metal anode-containing cells having
 electrolytes of organometallic-alkali metal salts and
 organic solvents
 INVENTOR(S): Klemann, Lawrence P.; Newman, Gerald H.
 PATENT ASSIGNEE(S): Exxon Research and Engineering Co., USA
 SOURCE: U.S., 6 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4060674	A	19771129	US 1976-750517	19761214
GB 1561933	A	19800305	GB 1977-40167	19770927
CA 1079351	A1	19800610	CA 1977-287605	19770927
DE 2745051	A1	19780615	DE 1977-2745051	19771006
DE 2745051	C2	19880616		
JP 53075435	A	19780704	JP 1977-126341	19771020
JP 58056232	B	19831214		
FR 2374749	A1	19780713	FR 1977-31921	19771024
FR 2374749	B1	19830923		
BE 860068	A1	19780425	BE 1977-182020	19771025
CH 630748	A5	19820630	CH 1977-13230	19771031
PRIORITY APPLN. INFO.:			US 1976-750517	A 19761214

AB Organic-electrolyte compns. for reversible alkali-metal batteries, e.g., Li batteries, are disclosed. The organic solvents are selected from the group consisting of inertly substituted and unsubstituted ethers, esters, sulfonates, organic sulfites, organic sulfates, organic nitrites, and organic nitrates. The elec. active salts are AMRn, where A is an alkali metal; M is Zn, Cd, B, Al, Ga, In, Tl, Sn, P, or As; and R is Me, Et, Ph, etc. Thus, elec. resistivities of several LiBRn in dioxalane electrolytes are reported as well as performances of Li-TiS2 batteries containing these electrolytes.

IT 7439-93-2, uses and miscellaneous
 RL: USES (Uses)
 (anodes, in organic-electrolyte battery with titanium
 sulfide cathode)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

IC H01M006-14
 INCL 429194000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium titanium sulfide battery; electrolyte org
 lithium battery; borate alkylaryl lithium battery
 IT Electric resistance
 (of lithium alkylarylborate-containing battery organic electrolytes)
 IT Batteries, secondary
 (lithium-titanium sulfide, lithium
 alkylarylborate-containing organic-electrolyte)
 IT 7439-93-2, uses and miscellaneous
 RL: USES (Uses)
 (anodes, in organic-electrolyte battery with titanium
 sulfide cathode)
 IT 2169-38-2 15243-31-9 17979-82-7 65859-85-0 65859-86-1 65859-87-2
 RL: USES (Uses)
 (battery electrolyte containing, lithium-titanium
 sulfide)
 IT 12039-13-3
 RL: USES (Uses)
 (cathodes, in organic-electrolyte battery with lithium
 anode)
 OS.CITING REF COUNT: 15 THERE ARE 15 CAPLUS RECORDS THAT CITE THIS
 RECORD (31 CITINGS)

***** QUERY RESULTS II *****
 (CLAIM 11)

=> d his 151

(FILE 'HCAPLUS' ENTERED AT 11:19:04 ON 03 MAR 2010)

L51 4 S L41 NOT L49

=> d que 151

L2 QUE ABB=ON PLU=ON NEGATIVE? (A) (ACTIVE? OR ELECTRODE)
 OR CATHODE

L3 QUE ABB=ON PLU=ON POSITIVE? (A) (ACTIVE? OR ELECTRODE)
 OR ANODE

L4 QUE ABB=ON PLU=ON SULFO? OR SULFA? OR SULFI? OR SULPHO
 ? OR SULPHA? OR SULPHI?

L5 QUE ABB=ON PLU=ON SULFUR? OR SULPHUR?

L6 QUE ABB=ON PLU=ON CONTAIN? OR MATERIAL? OR COMPOUND? O
 R SUBSTANC? OR ELEMENT? OR AGENT?

L7 QUE ABB=ON PLU=ON ELECTROACTIV? OR ELECTRO#(W)ACTIV?

L9 QUE ABB=ON PLU=ON LI OR LITHIUM

L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN

L11 28386 SEA FILE=HCAPLUS ABB=ON PLU=ON L10 (L) (DEV OR USES)/RL

L12 4390 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 (3A) (L4 OR L5)

L13 330724 SEA FILE=HCAPLUS ABB=ON PLU=ON (L6 OR L7) (3A) (L4 OR L5)

L14 32858 SEA FILE=HCAPLUS ABB=ON PLU=ON L3 (3A) (L9 OR L11)

L17 1664 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND L13

L18 436 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND L14

L19 QUE ABB=ON PLU=ON ADDITIVE? OR ADJUVANT? OR AUXILIAR?
 OR MODIF? OR AGENT? OR MEDIUM?

L20 QUE ABB=ON PLU=ON SOLVENT#

L21 QUE ABB=ON PLU=ON ETHER# OR CYCLIC (2A) ETHER# OR POLY
 ETHER# OR SULFON?

L22 89 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND L19

L24 138 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND (L20 OR L21)

L26 406800 SEA FILE=HCAPLUS ABB=ON PLU=ON (L4 OR L5) (5A) L6

L27 195 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 OR L24) AND L26

L32 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7790-69-4/RN

L33 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7757-79-1/RN

L34 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7789-18-6/RN

L35 1 SEA FILE=REGISTRY ABB=ON PLU=ON 10022-31-8/RN

L36 1 SEA FILE=REGISTRY ABB=ON PLU=ON 6484-52-2/RN

L37 21493 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L32 OR L33 OR L34 OR L35 OR
 L36)) (L) (MOA OR USES)/RL

L38 54408 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
 CESIUM OR BARIUM OR AMMONIUM) (W) NITRATE

L39 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L37

L40 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L38

L41 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L39 OR L40

L43 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13568-33-7/RN

L44 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7758-09-0/RN

L45 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13454-83-6/RN

L46 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13446-48-5/RN

L47 882 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L43 OR L44 OR L45 OR L46))
 (L) (MOA OR USES)/RL

L48 3119 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
 CESIUM OR AMMONIUM) (W) NITRITE

L49 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND (L47 OR L48)

L51 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L41 NOT L49

=> d 151 1-4 ibib abs hitstr hitind

L51 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2009:1371791 HCAPLUS Full-text
 DOCUMENT NUMBER: 152:15847
 TITLE: Method for manufacturing electrolyte for all-vanadium
 fluid flow battery
 INVENTOR(S): Liu, Suqin; Huang, Kelong; Wu, Xuwen; Zhang, Qinghua;
 Li, Hongyun; Liu, Weiwei; Zhong, Xiaoling; Shi,
 Xiaohu; Chen, Ruoyuan
 PATENT ASSIGNEE(S): Hunan Weibang New Energy Co., Ltd., Peop. Rep. China
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 13pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
CN 101572319	A	20091104	CN 2009-10148218	20090618
PRIORITY APPLN. INFO.:			CN 2009-10148218	20090618
AB	The title electrolyte comprises anode electrolyte and cathode electrolyte containing vanadium ions and sulfate ions. The concentration of sulfate ions in the anode electrolyte is larger than that of sulfate ions in the cathode electrolyte. The total vanadium concentration is 2.0-8.0mol/L.			
IT	7757-79-1, Potassium nitrate, uses 7790-69-4, Lithium nitrate RL: MOA (Modifier or additive use); USES (Uses) (additive, cathode electrolyte containing; method for manufacturing electrolyte for all-vanadium fluid flow cell)			
RN	7757-79-1 HCAPLUS			
CN	Nitric acid potassium salt (1:1) (CA INDEX NAME)			



● K

RN 7790-69-4 HCAPLUS
 CN Nitric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 7447-40-7, Potassium chloride, uses 7447-41-8, Lithium

chloride, uses 7631-99-4, Sodium nitrate, uses 7647-14-5, Sodium chloride, uses 7757-79-1, Potassium nitrate, uses 7757-82-6, Sodium sulfate, uses 7778-80-5, Potassium sulfate, uses 7790-69-4, Lithium nitrate 10377-48-7, Lithium sulfate
 RL: MOA (Modifier or additive use); USES (Uses)
 (additive, cathode electrolyte containing;
 method for manufacturing electrolyte for all-vanadium fluid flow cell)

L51 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2010 ACS ON STN
 ACCESSION NUMBER: 2002:540172 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:111688
 TITLE: Electrochemical cell having an electrode with a nitrite additive in the electrode active mixture

INVENTOR(S): Gan, Hong; Takeuchi, Esther S.
 PATENT ASSIGNEE(S): Wilson Greatbatch Ltd., USA
 SOURCE: U.S. Pat. Appl. Publ., 8 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20020094480	A1	20020718	US 2001-765266	20010118
US 6528207	B2	20030304		

PRIORITY APPLN. INFO.: US 2001-765266 20010118
 ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
 OTHER SOURCE(S): MARPAT 137:111688

AB Electrode-active materials for primary or secondary lithium batteries are fabricated in a method that includes mixing the active electrode material with a nitrite ester prior to contact of the active material with its current collector. The resulting electrode couple is activated by a non-aqueous electrolyte (especially containing Li salts) which dissolves the nitrite ester. The unsatd. nitrite ester has the general structure (RO)N(:O), in which R is C1-10-saturated hydrocarbyl or heteroatom group, or C2-10-unsatd. hydrocarbyl or heteroatom group. Suitable nitrite esters include Me nitrite, Et nitrite, Pr nitrite, iso-Pr nitrite, Bu nitrite, tert-Bu nitrite, iso-Bu nitrite, benzyl nitrite, and Ph nitrite. The nitrite ester is present in the anode and cathode active materials at a 0.05-5.0 weight% level.

IT 7439-93-2, Lithium, uses
 RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (battery anode; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

L1

IT 7790-69-4, Lithium nitrate
 RL: DEV (Device component use); USES (Uses)

(nonaq. battery electrolytes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)

RN 7790-69-4 HCAPLUS

CN Nitric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

- IC ICM H01M004-62
ICS H01M004-54; H01M004-52; H01M004-58; H01M004-50; H01M004-40;
H01M010-40
- INCL 4292120000; X42-921.9; X42-923.2; X42-923.15; X42-922.4; X42-922.3;
X42-922.1; X42-922.0; X42-921.7; X42-934.1
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST battery electrode unsatd nitrite ester additive; cathode
anode battery unsatd nitrite ester additive; electrolyte
nonaq lithium battery nitrite ester additive
- IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(binder, battery electrodes containing; electrode-active materials for
primary or secondary lithium batteries containing unsatd. nitrite
ester additives)
- IT Carbon black, uses
Chalcogenides
Oxides (inorganic), uses
Selenides
Sulfides, uses
Tellurides
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(conductive additive, battery electrodes containing;
electrode-active materials for primary or secondary lithium
batteries containing unsatd. nitrite ester additives)
- IT Battery anodes
Battery cathodes
Battery electrodes
(electrode-active materials for primary or secondary lithium
batteries containing unsatd. nitrite ester additives)
- IT Lactams
Lactones
RL: DEV (Device component use); USES (Uses)
(nonaq. battery electrolytes containing; electrode-active materials for
primary or secondary lithium batteries containing unsatd. nitrite
ester additives)
- IT Battery electrolytes
(nonaq.; electrode-active materials for primary or secondary
lithium batteries containing unsatd. nitrite ester
additives)
- IT 7439-93-2, Lithium, uses 72785-69-4
RL: CPS (Chemical process); DEV (Device component use); PEP
(Physical, engineering or chemical process); PROC (Process); USES
(Uses)

- (battery anode; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
- IT 1307-96-6, Cobalt oxide, uses 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide (NiO), uses 1317-38-0, Copper oxide, uses 11105-02-5, Silver vanadium oxide 11115-78-9, Copper sulfide 11126-12-8, Iron sulfide 12039-13-3, Titanium disulfide 12068-85-8, Iron disulfide 12789-09-2, Copper vanadium oxide 51311-17-2, Carbon fluoride 181183-66-4, Copper silver vanadium oxide
- RL: DEV (Device component use); USES (Uses)
(battery cathode containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
- IT 12026-36-7, Silver vanadium oxide (AgV2O5.5) 173478-95-0, Silver vanadium oxide (Ag0.35V2O5.18) 346712-58-1, Silver vanadium oxide (Ag0.8V2O5.4)
- RL: DEV (Device component use); USES (Uses)
(battery cathodes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
- IT 7439-89-6D, Iron, chalcogenides 7439-96-5D, Manganese, chalcogenides 7439-98-7D, Molybdenum, chalcogenides 7440-02-0D, Nickel, chalcogenides 7440-03-1D, Niobium, chalcogenides 7440-32-6D, Titanium, chalcogenides 7440-44-0, Carbon, uses 7440-47-3D, Chromium, chalcogenides 7440-48-4D, Cobalt, chalcogenides 7440-50-8D, Copper, chalcogenides 7440-62-2D, Vanadium, chalcogenides 7782-42-5, Graphite, uses
- RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(conductive additive, battery electrodes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
- IT 109-95-5, Ethyl nitrite 540-80-7, tert-Butyl nitrite 541-42-4, Isopropyl nitrite 542-56-3, Isobutyl nitrite 543-67-9, Propyl nitrite 544-16-1, Butyl nitrite 624-91-9, Methyl nitrite 935-05-7, Benzyl nitrite 7782-77-6D, Nitrous acid, esters 34207-39-1, Nitrous acid, phenyl ester
- RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(nonaq. battery electrolyte containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)
- IT 67-68-5, Dimethyl sulfoxide, uses 68-12-2, Dimethyl formamide, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-20-3, Diisopropyl ether 108-29-2, γ -Valerolactone 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane 111-96-6, Diglyme 112-49-2, Triglyme 127-19-5, Dimethyl acetamide 143-24-8, Tetraglyme 463-79-6D, Carbonic acid, dialkyl esters 556-65-0, Lithium thiocyanate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 629-14-1, 1,2-Diethoxyethane 872-50-4, N-Methylpyrrolidone, uses 2923-17-3, Lithium trifluoroacetate 2923-20-8, Ethanesulfonic acid, pentafluoro-, lithium salt 4437-85-8, Butylene carbonate 5137-45-1, 1-Ethoxy-2-methoxyethane 7790-69-4, Lithium nitrate 7791-03-9, Lithium perchlorate 13453-75-3, Lithium fluorosulfonate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium

hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 30215-10-2, Lithium benzenesulfonate 33454-82-9, Lithium trifluoromethanesulfonate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9, Methyl propyl carbonate, uses 90076-65-6, Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt 132404-42-3, Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium

RL: DEV (Device component use); USES {Uses}
(nonaq. battery electrolytes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses 12597-68-1, Stainless steel, uses

RL: DEV (Device component use); MOA (Modifier or additive use); USES {Uses}
(powder, conductive additive, battery electrodes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. nitrite ester additives)

L51 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2002:540171 HCAPLUS Full-text

DOCUMENT NUMBER: 137:111687
TITLE: Electrode-active materials for primary or secondary lithium batteries containing unsaturated phosphate ester additives

INVENTOR(S): Gan, Hong; Takeuchi, Esther S.
PATENT ASSIGNEE(S): Wilson Greatbatch Ltd., USA
SOURCE: U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20020094479	A1	20020718	US 2001-761626	20010117
US 6511772	B2	20030128		

PRIORITY APPLN. INFO.: US 2001-761626 20010117
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
OTHER SOURCE(S): MARPAT 137:111687

AB Electrode-active materials for primary or secondary lithium batteries are fabricated in a method that includes mixing the active electrode material with an unsatd. phosphate ester prior to contact of the active material with its current collector. The resulting electrode couple is activated by a non-aqueous electrolyte (especially containing Li salts) which dissolves the phosphate ester. The unsatd. phosphate ester has the general structure (R1)P(:O)(OR2)(OR3), in which at least one of the R groups is H (but not all 3) and at least one of the R groups is a C₂-unsatd. group. Suitable phosphate esters include monobenzyl phosphate, benzyl phosphate, benzyl di-Me phosphate, allyl di-Me phosphate, cyanomethyl di-Me phosphate, etc.

IT 7439-93-2, Lithium, uses

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES {Uses}
(battery anode; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IT 7790-69-4, Lithium nitrate
 RL: DEV (Device component use); USES (Uses)
 (nonaq. battery electrolytes containing; electrode-active
 materials for primary or secondary lithium batteries containing
 unsatd. phosphate ester additives)
 RN 7790-69-4 HCAPLUS
 CN Nitric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M004-62
 ICS H01M010-40; H01M004-54
 INCL 429212000; X42-923.2; X42-921.7; X42-934.2; X42-934.1; X42-933.0;
 X42-933.2; X42-921.9; X42-923.15; X42-9 5.2
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST battery electrode unsatd phosphate ester additive; cathode
 anode battery unsatd phosphate ester additive;
 electrolyte nonaq lithium battery phosphate ester
 additive
 IT Carbon black, uses
 Selenides
 Sulfides, uses
 Tellurides
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (conductive additive, battery electrodes containing;
 electrode-active materials for primary or secondary lithium
 batteries containing unsatd. phosphate ester additives)
 IT Battery anodes
 Battery cathodes
 Battery electrodes
 (electrode-active materials for primary or secondary lithium
 batteries containing unsatd. phosphate ester additives)
 IT Chalcogenides
 Oxides (inorganic), uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (metal, conductive additive, battery electrodes containing;
 electrode-active materials for primary or secondary lithium
 batteries containing unsatd. phosphate ester additives)
 IT Lactams
 Lactones
 RL: DEV (Device component use); USES (Uses)

- (nonaq. battery electrolytes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT Battery electrolytes
(nonaq.; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT 7439-93-2, Lithium, uses 72785-69-4
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(battery anode; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT 1307-96-6, Cobalt oxide, uses 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide, uses 1317-38-0, Copper oxide, uses 11105-02-5, Silver vanadium oxide 11115-78-9, Copper sulfide 11126-12-8, Iron sulfide 12026-36-7, Silver vanadium oxide (AgV2O5.5) 12039-13-3, Titanium disulfide 12068-85-8, Iron disulfide 12789-09-2, Copper vanadium oxide 173478-95-0, Silver vanadium oxide (Ag0.35V2O5.18) 181183-66-4, Copper silver vanadium oxide 346712-58-1, Silver vanadium oxide (Ag0.8V2O5.4)
RL: DEV (Device component use); USES (Uses)
(battery cathode containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT 7439-89-6D, Iron, chalcogenides 7439-96-5D, Manganese, chalcogenides 7439-98-7D, Molybdenum, chalcogenides 7440-02-0D, Nickel, chalcogenides 7440-03-1D, Niobium, chalcogenides 7440-32-6D, Titanium, chalcogenides 7440-44-0, Carbon, uses 7440-47-3D, Chromium, chalcogenides 7440-48-4D, Cobalt, chalcogenides 7440-50-8D, Copper, chalcogenides 7440-62-2D, Vanadium, chalcogenides 7782-42-5, Graphite, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(conductive additive, battery electrodes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT 1623-07-0, Benzyl phosphate 1623-10-5, Diallyl methyl phosphate 1623-19-4, Triallyl phosphate 1707-92-2, Tribenzyl phosphate 1779-34-6, Tripropargyl phosphate 7664-38-2D, Phosphoric acid, unsatd. esters 7748-09-6, Diallyl phosphate 55343-62-9, Propargyl phosphate 56379-74-9, Phosphoric acid, dimethyl 2-propynyl ester 67293-73-6, Phosphoric acid, dimethyl phenylmethyl ester 142804-89-5, Phosphoric acid, phenylmethyl ester 433979-69-2, Phosphoric acid, dimethyl nitromethyl ester 433979-70-5, 2-Propyn-1-ol, hydrogen phosphate 433979-71-6, Phosphoric acid, cyanomethyl dimethyl ester 433979-72-7, Phosphoric acid, bis(cyanomethyl) methyl ester
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(nonaq. battery electrolyte containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)
- IT 67-68-5, Dimethyl sulfoxide, uses 68-12-2, Dimethyl formamide, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-20-3, Diisopropyl ether 108-29-2, γ -Valerolactone 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane 111-96-6, Diglyme 112-49-2, Triglyme 127-19-5, Dimethyl acetamide 143-24-8, Tetraglyme 463-79-6D, Carbonic acid, dialkyl esters 556-65-0, Lithium

thiocyanate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 629-14-1, 1,2-Diethoxyethane 872-50-4, uses 2923-17-3, Lithium trifluoroacetate 2923-20-8, Ethanesulfonic acid, pentafluoro-, lithium salt 4437-85-8, Butylene carbonate 5137-45-1, 1-Ethoxy-2-methoxyethane 7790-69-4, Lithium nitrate 7791-03-9, Lithium perchlorate 13453-75-3, Lithium fluorosulfonate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 30215-10-2, Lithium benzenesulfonate 33454-82-9, Lithium trifluoromethanesulfonate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9, Methyl propyl carbonate, uses 90076-65-6, Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt 132404-42-3, Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium

RL: DEV (Device component use); USES (Uses)

(nonaq. battery electrolytes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses 12597-68-1, Stainless steel, uses

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(powder, conductive additive, battery electrodes containing; electrode-active materials for primary or secondary lithium batteries containing unsatd. phosphate ester additives)

OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

L51 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2010 ACS ON STN

ACCESSION NUMBER: 1990:220375 HCAPLUS Full-text

DOCUMENT NUMBER: 112:220375

ORIGINAL REFERENCE NO.: 112:37171a, 37174a

TITLE: Nonaqueous lithium alloy battery

INVENTOR(S): Furukawa, Nobuhiro; Yoshimura, Seiji; Takahashi, Masatoshi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 48 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 349675	A2	19900110	EP 1988-119035	19881115
EP 349675	A3	19900509		
EP 349675	B1	19970416		
R: CH, DE, FR, GB, LI, NL, SE				
JP 02015566	A	19900119	JP 1988-165724	19880701
JP 06073303	B	19940914		
JP 02015567	A	19900119	JP 1988-165725	19880701
JP 07015821	B	19950222		
JP 02015568	A	19900119	JP 1988-165726	19880701
JP 2698103	B2	19980119		

10/585496

CA 1308778	C	19921013	CA 1988-582548	19881108
US 5112704	A	19920512	US 1990-492267	19900228
CA 1317631	C2	19930511	CA 1992-616388	19920526
CA 1317632	C2	19930511	CA 1992-616389	19920526
CA 1317633	C2	19930511	CA 1992-616390	19920526

PRIORITY APPLN. INFO.:

	JP 1988-165724	A	19880701
	JP 1988-165725	A	19880701
	JP 1988-165726	A	19880701
	US 1988-267591	B1	19881107
	CA 1988-582548	A3	19881108

AB The battery includes an electrolyte of LiF3CSO3 and organic solvent mixture of ≥ 2 high b.p. solvents and including ≥ 1 cyclic carbonate. The solvent mixture comprises ethylene carbonate (EC), butylene carbonate, and DME; EC, γ -butyrolactone, and DME; or propylene carbonate, sulfolane, and THF. The battery cathode is selected from oxides, sulfides, and halides. LiF3CSO3 is heated, dried, and dehydrated in a vacuum at 80-150°. The electrolyte contains an inhibitor for inhibiting reaction between the battery can and the electrolyte. The inhibitor is selected from LiNO3, (EtO)3PO, (n-BuO)3PO, N,N,N',N'-tetramethyl ethylenediamine, etc.

IT 7790-69-4, Lithium nitrate
 RL: USES (Uses)
 (corrosion inhibitors, electrolyte containing, for nonaq. lithium alloy batteries)

RN 7790-69-4 HCAPLUS

CN Nitric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery electrolyte solvent mixt; carbonate
 cyclic electrolyte lithium battery; oxide lithium
 nonaq battery; inhibitor lithium nonaq battery;
 trifluoromethanesulfonate lithium nonaq battery

IT Batteries, primary
 (button-type, lithium alloy, with nonaq. electrolyte containing
 lithium trifluoromethanesulfonate and cyclic carbonate)

IT 71849-42-8 71849-43-9, Lithium base, tin 72785-69-4
 72785-91-2 72785-92-3 75418-59-6 77194-65-1, Calcium,
 lithium base 77194-67-3, Lithium base, strontium
 77194-68-4, Barium, lithium base 77194-70-8 97838-40-9,
 Gallium, lithium base 97838-42-1
 RL: USES (Uses)
 (anodes, batteries containing, electrolytes for)

IT 1313-13-9, Manganese dioxide, uses and miscellaneous 1313-27-5,
 Molybdenum oxide (MoO3), uses and miscellaneous 1314-62-1, Vanadium
 oxide (V2O5), uses and miscellaneous 1317-33-5, Molybdenum disulfide,
 uses and miscellaneous 1317-37-9, Iron sulfide (FeS)
 1317-38-0, Copper oxide (CuO), uses and miscellaneous 11113-63-6,
 Graphite fluoride 11118-57-3, Chromium oxide 12039-13-3, Titanium
 disulfide

RL: USES (Uses)

(cathodes, lithium alloy batteries contg
., electrolytes for)

IT 78-40-0, Triethyl phosphate 110-18-9 126-73-8, Phosphoric acid
tributyl ester, uses and miscellaneous 147-84-2, reactions 150-61-8
7790-69-4, Lithium nitrate 7803-65-8
127204-51-7

RL: USES (Uses)

(corrosion inhibitors, electrolyte containing, for nonaq. lithium
alloy batteries)

IT 96-48-0, γ -Butyrolactone 96-49-1, 1,3-Dioxolan-2-one 108-32-7,
Propylene carbonate 109-99-9, THF, uses and miscellaneous 110-71-4
126-33-0, Sulfolane 4437-85-8, Butylene carbonate

RL: USES (Uses)

(electrolyte solvents containing, for lithium
trifluoromethanesulfonate, in lithium alloy batteries)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD
(2 CITINGS)

***** QUERY RESULTS III *****
(CLAIM 12)

=> d his 149

(FILE 'HCAPLUS' ENTERED AT 11:19:04 ON 03 MAR 2010)

L49 6 S L27 AND (L47 OR L48)

=> d que 149

L2 QUE ABB=ON PLU=ON NEGATIVE? (A) (ACTIVE? OR ELECTRODE)
OR CATHODE

L3 QUE ABB=ON PLU=ON POSITIVE? (A) (ACTIVE? OR ELECTRODE)
OR ANODE

L4 QUE ABB=ON PLU=ON SULFO? OR SULFA? OR SULFI? OR SULPHO
? OR SULPHA? OR SULPHI?

L5 QUE ABB=ON PLU=ON SULFUR? OR SULPHUR?

L6 QUE ABB=ON PLU=ON CONTAIN? OR MATERIAL? OR COMPOUND? O
R SUBSTANC? OR ELEMENT? OR AGENT?

L7 QUE ABB=ON PLU=ON ELECTROACTIV? OR ELECTRO#(W)ACTIV?

L9 QUE ABB=ON PLU=ON LI OR LITHIUM

L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN

L11 28386 SEA FILE=HCAPLUS ABB=ON PLU=ON L10 (L) (DEV OR USES)/RL

L12 4390 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 (3A) (L4 OR L5)

L13 330724 SEA FILE=HCAPLUS ABB=ON PLU=ON (L6 OR L7) (3A) (L4 OR L5)

L14 32858 SEA FILE=HCAPLUS ABB=ON PLU=ON L3 (3A) (L9 OR L11)

L17 1664 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND L13

L18 436 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND L14

L19 QUE ABB=ON PLU=ON ADDITIVE? OR ADJUVANT? OR AUXILIAR?
OR MODIF? OR AGENT? OR MEDIUM?

L20 QUE ABB=ON PLU=ON SOLVENT#

L21 QUE ABB=ON PLU=ON ETHER# OR CYCLIC (2A) ETHER# OR POLY
ETHER# OR SULFON?

L22 89 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND L19

L24 138 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND (L20 OR L21)

L26 406800 SEA FILE=HCAPLUS ABB=ON PLU=ON (L4 OR L5) (5A) L6

L27 195 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 OR L24) AND L26

L43 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13568-33-7/RN

L44 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7758-09-0/RN

L45 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13454-83-6/RN

L46 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13446-48-5/RN

L47 882 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L43 OR L44 OR L45 OR L46))
(L) (MOA OR USES)/RL

L48 3119 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
CESIUM OR AMMONIUM) (W) NITRITE

L49 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND (L47 OR L48)

=> d 149 1-6 ibib abs hitstr hitind

L49 ANSWER 1 OF 6 HCAPLUS COPYRIGHT 2010 ACS ON STN
ACCESSION NUMBER: 2010:42091 HCAPLUS Full-text
DOCUMENT NUMBER: 152:156024
TITLE: Methods for charging lithium sulfur cells
INVENTOR(S): Mikhaylik, Yuriy V.
PATENT ASSIGNEE(S): Sion Power Corporation, USA
SOURCE: U.S., 20 pp., Cont.-in-part of U.S. Ser. No. 753,123.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 7646171	B2	20100112	US 2006-388643	20060323
WO 2005069405	A2	20050728	WO 2005-US495	20050106
WO 2005069405	A3	20060817		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, SM RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 101656334	A	20100224	CN 2009-10146153	20050106
JP 2009530796	T	20090827	JP 2009-501574	20070322
PRIORITY APPLN. INFO.:				
			US 2004-753123	A2 20040106
			WO 2005-US495	A2 20050106
			CN 2005-80006966	A3 20050106
			US 2006-388643	A 20060323
			WO 2007-US7219	W 20070322

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB Disclosed is a method for charging a lithium-sulfur electrochem. cell wherein the lithium-sulfur cell comprises a cathode comprising an electroactive sulfur-containing material, an anode comprising lithium, and a nonaq. electrolyte. Also disclosed are methods for determining charge termination when charging lithium-sulfur cells.

IT 7439-93-2, Lithium, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode, foil; methods for charging lithium sulfur cells)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IT 7758-09-0, Potassium nitrite
 13446-48-5, Ammonium nitrite
 13454-83-6, Cesium nitrite
 RL: TEM (Technical or engineered material use); USES (Uses)
 (electrolyte containing; methods for charging lithium sulfur cells)

RN 7758-09-0 HCAPLUS

CN Nitrous acid, potassium salt (1:1) (CA INDEX NAME)

C=N-OH

● K

RN 13446-48-5 HCAPLUS
 CN Nitrous acid, ammonium salt (1:1) (CA INDEX NAME)

$\text{O}=\text{N}-\text{OH}$

● NH_3

RN 13454-83-6 HCAPLUS
 CN Nitrous acid, cesium salt (8CI, 9CI) (CA INDEX NAME)

$\text{O}=\text{N}-\text{OH}$

● Cs

INCL 320132000; 320149000; 324426000; 429188000; 340636100; 340636210
 CC 72-3 (Electrochemistry)
 Section cross-reference(s): 52
 ST charging lithium sulfur cell
 IT Secondary batteries
 (lithium-sulfur; methods for charging lithium
 sulfur cells)
 IT Electrochemical cells
 (methods for charging lithium sulfur cells)
 IT Polyesters
 RL: TEM (Technical or engineered material use); USES (Uses)
 (methods for charging lithium sulfur cells)
 IT Polyolefins
 RL: TEM (Technical or engineered material use); USES (Uses)
 (porous separator; methods for charging lithium sulfur cells)
 IT 7429-90-5, Aluminum, uses 25038-59-9, PET, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (aluminum/PET film substrate, cathode; methods for charging
 lithium sulfur cells)
 IT 7439-93-2, Lithium, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode, foil; methods for charging lithium sulfur
 cells)
 IT 7440-44-0, Carbon, uses
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or
 engineered material use); PROC (Process); USES (Uses)
 (cathode coating and coating mixture containing; methods for
 charging lithium sulfur cells)
 IT 7704-34-9, Sulfur, uses
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or
 engineered material use); PROC (Process); USES (Uses)
 (cathode coating mixture containing; methods for charging

lithium sulfur cells)

IT 75-52-5, Nitromethane, uses 98-95-3, Nitrobenzene, uses 108-03-2, 1-Nitropropane 109-95-5, Ethyl nitrite 111-96-6, Diglyme 112-49-2, Triglyme 463-04-7, Pentyl nitrite 506-93-4, Guanidinium nitrate 543-53-3, Pyridinium nitrate 543-67-9, Propyl nitrite 544-16-1, Butyl nitrite 556-65-0, Lithium thiocyanate (LiSCN) 610-39-9, 3,4-Dinitrotoluene 628-81-9, Butyl ethyl ether 629-46-9, Octyl nitrite 646-06-0, 1,3-Dioxolane 694-59-7, Pyridine N-oxide 1321-12-6, Nitrotoluene 2564-83-2 6484-52-2, Ammonium nitrate, uses 7550-35-8, Lithium bromide (LiBr) 7757-79-1, Potassium nitrate, uses 7758-09-0, Potassium nitrate 7789-18-6, Cesium nitrate 7790-69-4, Lithium nitrate 7791-03-9, Lithium perchlorate (LiClO4) 10022-31-8, Barium nitrate 10377-51-2, Lithium iodide (LiI) 13446-48-5, Ammonium nitrite 13454-83-6, Cesium nitrate 14283-07-9 14485-20-2 21324-40-3, Lithium hexafluorophosphate (LiPF6) 25154-53-4, Dimethoxyethane 25154-54-5, Dinitrobenzene 25321-14-6, Dinitrotoluene 25322-01-4, Nitropropane 29935-35-1, Lithium hexafluoroarsenate (LiAsF6) 33454-82-9, Lithium trifluoromethyl sulfonate 56778-64-4, Nitropyridine 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide 132404-42-3 143314-14-1, 1-Ethyl-3-methylimidazolium nitrate 1184304-91-3

RL: TEM (Technical or engineered material use); USES (Uses) (electrolyte containing; methods for charging lithium sulfur cells)

IT 67-63-0, Isopropanol, uses

RL: NUU (Other use, unclassified); USES (Uses) (methods for charging lithium sulfur cells)

IT 9002-88-4, Polyethylene

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses) (powder, cathode coating mixture containing; methods for charging lithium sulfur cells)

REFERENCE COUNT: 48 THERE ARE 48 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 2 OF 6 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2008:978678 HCAPLUS Full-text

DOCUMENT NUMBER: 149:271549

TITLE: Electrolytes for lithium sulfur batteries

INVENTOR(S): Mikhaylik, Yuriy V.

PATENT ASSIGNEE(S): Sion Power Corp., USA

SOURCE: U.S. Pat. Appl. Publ., 19 pp., Cont.-in-part of U. S. Ser. No. 99,107.
CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20080193835	A1	20080814	US 2008-106079	20080418
US 20050147891	A1	20050707	US 2004-752876	20040106
US 7354680	B2	20080408		
US 20080187840	A1	20080807	US 2008-99107	20080407
US 7553590	B2	20090630		
PRIORITY APPLN. INFO.:			US 2004-752876	A3 20040106
			US 2008-99107	A2 20080407

10/585496

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 149:271549

AB Disclosed is an additive for an electrochem. cell wherein the additive includes an N-O bond. The additive is most preferably included in a nonaq. electrolyte of the cell. Also disclosed are cells and batteries including the additive, and methods of charging the batteries and cells. An electrochem. cell including the additive preferably has an anode that includes lithium and a cathode including an electroactive sulfur-containing material.

IT 7758-09-0, Potassium nitrite
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolytes for lithium sulfur batteries)

RN 7758-09-0 HCAPLUS

CN Nitrous acid, potassium salt (1:1) (CA INDEX NAME)

$\text{C}=\text{N}-\text{OH}$

● K

IT 7439-93-2, Lithium, uses 7439-93-2D,
 Lithium, salt
 RL: TEM (Technical or engineered material use); USES (Uses)
 (electrolytes for lithium sulfur batteries)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

INCL 429156000; 429341000; 429337000; 429326000; 429329000; 429334000;
 429335000; 429163000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium sulfur battery electrolyte

IT Acetals
 RL: TEM (Technical or engineered material use); USES (Uses)
 (acyclic; electrolytes for lithium sulfur batteries)

IT Acetals
 Ethers
 RL: TEM (Technical or engineered material use); USES (Uses)
 (cyclic; electrolytes for lithium sulfur batteries)

IT Battery electrolytes
 Secondary batteries
 (electrolytes for lithium sulfur batteries)

IT Nitramines
Nitrones
Nitroso compounds
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Ethers
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Polyethers
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Sulfones
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT 75-52-5, Nitromethane, uses 108-03-2, 1-Nitropropane 135-20-6,
Cupferron 148-97-0D, N-Nitroso-N-phenyl-hydroxylamine, alkali metal salt
148-97-0D, N-Nitroso-N-phenyl-hydroxylamine, substituted quaternary
ammonium salt 506-93-4, Guanidinium nitrate 610-39-9,
3,4-Dinitrotoluene 2564-83-2, TEMPO 2696-92-6, Nitroso chloride
6484-52-2, Ammonium nitrate, uses 7757-79-1, Potassium nitrate, uses
7758-09-0, Potassium nitrite 7782-78-7,
Nitrosonium hydrogen sulfate 7782-94-7, Nitramide 7782-94-7D,
Nitramide, alkali metal salt 7782-94-7D, Nitramide, ammonium salt
7789-18-6, Cesium nitrate 7789-25-5, Nitrosyl fluoride 7790-69-4,
Lithium nitrate 7803-49-8, Hydroxylamine, uses 11094-71-6,
IsoNitrosyl fluoride 13826-86-3, Nitronium tetrafluoroborate
14452-93-8D, Nitrosonium, salt 14522-82-8D, Nitronium, salt
14635-75-7, Nitrosonium tetrafluoroborate 16921-91-8, Nitrosonium
hexafluorophosphate 17495-82-8, Nitronium fluorosulfonate 19200-21-6,
Nitronium hexafluorophosphate 42262-35-1, Nitronium triflate
103360-20-9, IsoNitrosyl chloride 114045-20-4, Nitramide, nitro-
114045-20-4D, Nitramide, nitro-, alkali metal salt 114045-20-4D,
Nitramide, nitro-, ammonium salt 143314-14-1,
1-Ethyl-3-methylimidazolium nitrate 1046820-14-7 1046820-16-9
1046820-18-1 1046820-20-5
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT 110-71-4 111-96-6, Diglyme 112-49-2, Triglyme 646-06-0,
1,3-Dioxolane 7439-93-2, Lithium, uses
7439-93-2D, Lithium, salt 7704-34-9, Sulfur, uses
33454-82-9, Lithium triflate 90076-65-6, Lithium
bis(trifluoromethylsulfonyl)imide
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytes for lithium sulfur batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD
(1 CITINGS)

L49 ANSWER 3 OF 6 HCAPLUS COPYRIGHT 2010 ACS ON STN
ACCESSION NUMBER: 2005:673529 HCAPLUS Full-text
DOCUMENT NUMBER: 143:176219
TITLE: Methods of charging lithium sulfur battery
cells
INVENTOR(S): Mikhaylik, Yuriy V.
PATENT ASSIGNEE(S): Moltech Corporation, USA; Sion Power of Corporation
SOURCE: PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005069405	A2	20050728	WO 2005-US495	20050106
WO 2005069405	A3	20060817		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, SM			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2552645	A1	20050728	CA 2005-2552645	20050106
EP 1714339	A2	20061025	EP 2005-705255	20050106
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU			
CN 1930711	A	20070314	CN 2005-80006966	20050106
CN 100524917	C	20090805		
JP 2007518231	T	20070705	JP 2006-547632	20050106
CN 101656334	A	20100224	CN 2009-10146153	20050106
US 7646171	B2	20100112	US 2006-388643	20060323
KR 2006127973	A	20061213	KR 2006-715874	20060804
PRIORITY APPLN. INFO.:			US 2004-753123	A 20040106
			CN 2005-80006966	A3 20050106
			WO 2005-US495	W 20050106

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A method of charging a lithium-sulfur electrochem. cell is described wherein the lithium-sulfur cell comprises a cathode comprising an electroactive sulfur-containing material, an anode comprising lithium, and a nonaq. electrolyte. The cells, which deliver a high percentage of the theor. discharge capacity, exhibit a high charge-discharge efficiency and/or show low self-discharge rates, contain electrolytes with ≥ 1 N-O compound in a concentration of about 0.02M to about 2.0M.

IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)

(lithium-sulfur battery with improved discharge capacity and high charge-discharge efficiency with electrolyte containing nitrogen-oxygen compound)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

IT 7758-09-0, Potassium nitrite

RL: TEM (Technical or engineered material use); USES (Uses)

(lithium-sulfur battery with improved discharge capacity and high charge-discharge efficiency with electrolyte containing nitrogen-oxygen compound)

RN 7758-09-0 HCAPLUS

CN Nitrous acid, potassium salt (1:1) (CA INDEX NAME)

$\text{C}=\text{N}-\text{OH}$
 K

IC ICM H01M
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium sulfur battery charging electrolyte
 IT Ethers, uses
 RL: DEV (Device component use); USES (Uses)
 (cyclic; methods of charging lithium sulfur battery cells)
 IT Secondary batteries
 (lithium; lithium-sulfur battery with improved discharge capacity and high charge-discharge efficiency with electrolyte containing nitrogen-oxygen compound)
 IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses
 RL: DEV (Device component use); USES (Uses)
 (lithium-sulfur battery with improved discharge capacity and high charge-discharge efficiency with electrolyte containing nitrogen-oxygen compound)
 IT 75-52-5, Nitromethane, uses 98-95-3, Nitrobenzene, uses 108-03-2, 1-Nitropropane 506-93-4, Guanidine nitrate 543-53-3, Pyridinium nitrate 556-65-0, Lithium thiocyanate 610-39-9, 3,4-Dinitrotoluene 1321-12-6, Nitrotoluene 2564-83-2, Tempo 6484-52-2, Ammonium nitrate, uses 7757-79-1, Potassium nitrate, uses 7758-09-0, Potassium nitrate 7789-18-6, Cesium nitrate 7790-69-4, Lithium nitrate 10022-31-8, Barium nitrate 25154-54-5, DiNitrobenzene 33454-82-9, Lithium triflate 52006-62-9, Nitrobutane 56778-64-4, Nitropyridine 90076-65-6 143314-14-1, 1-Ethyl-3-methylimidazolium nitrate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (lithium-sulfur battery with improved discharge capacity and high charge-discharge efficiency with electrolyte containing nitrogen-oxygen compound)
 OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)
 REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 4 OF 6 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2005:592008 HCAPLUS Full-text
 DOCUMENT NUMBER: 143:100401
 TITLE: Electrolytes for lithium sulfur batteries
 INVENTOR(S): Mikhaylik, Yuriy V.
 PATENT ASSIGNEE(S): Moltech Corp., USA; Sion Power Corporation
 SOURCE: U.S. Pat. Appl. Publ., 18 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20050147886	A1	20050707	US 2004-753031	20040106

US 7358012 B2 20080415
CA 2552418 A1 20050728 CA 2005-2552418 20050106
WO 2005069409 A2 20050728 WO 2005-US494 20050106
WO 2005069409 A3 20050915

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT,
RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
MR, NE, SN, TD, TG

EP 1702383 A2 20060920 EP 2005-705254 20050106
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS

CN 1930725 A 20070314 CN 2005-80006955 20050106
JP 2007518230 T 20070705 JP 2006-547631 20050106
KR 2006125853 A 20061206 KR 2006-715871 20060804
US 20070082264 A1 20070412 US 2006-585496 20061030

PRIORITY APPLN. INFO.: US 2004-753031 A 20040106
WO 2005-US494 W 20050106

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB Disclosed is an electrochem. cell comprising a lithium anode and a sulfur-
containing cathode and a nonaq. electrolyte. The cell exhibits high
utilization of the electroactive sulfur-containing material of the cathode and
a high charge-discharge efficiency.

IT 7439-93-2, Lithium, uses 7439-93-2D,
Lithium, salts
RL: DEV (Device component use); USES (Uses)
(electrolytes for lithium sulfur batteries)

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS
CN Lithium (CA INDEX NAME)

Li

IT 7758-09-0, Potassium nitrite
13446-48-5, Ammonium nitrite
13454-83-6, Cesium nitrite
13568-33-7, Lithium nitrite
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

RN 7758-09-0 HCAPLUS
CN Nitrous acid, potassium salt (1:1) (CA INDEX NAME)



RN 13446-48-5 HCAPLUS
 CN Nitrous acid, ammonium salt (1:1) (CA INDEX NAME)



RN 13454-83-6 HCAPLUS
 CN Nitrous acid, cesium salt (8CI, 9CI) (CA INDEX NAME)



RN 13568-33-7 HCAPLUS
 CN Nitrous acid, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M004-58
 ICS H01M010-40
 INCL 429218100; X42-923.195; X42-932.6; X42-932.9; X42-933.9; X42-934.0;
 X42-934.1; X42-933.7
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST electrolyte lithium sulfur battery
 IT Ethers
 RL: DEV (Device component use); USES (Uses)
 (cyclic; electrolytes for lithium sulfur batteries)
 IT Battery electrolytes
 (electrolytes for lithium sulfur batteries)
 IT Ethers
 Polyethers
 Sulfones

RL: DEV (Device component use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Nitrates
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Nitrites
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Secondary batteries
(lithium; electrolytes for lithium sulfur
batteries)

IT Nitro compounds
RL: MOA (Modifier or additive use); USES (Uses)
(organic; electrolytes for lithium sulfur batteries)

IT 110-71-4 646-06-0, Dioxolane 7439-93-2, Lithium,
uses 7439-93-2D, Lithium, salts 7704-34-9, Sulfur,
uses
RL: DEV (Device component use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT 75-52-5, Nitromethane, uses 98-95-3, Nitrobenzene, uses 108-03-2,
1-Nitropropane 506-93-4, Guanidinium nitrate 556-65-0, Lithium
thiocyanate 1321-12-6, Nitrotoluene 2564-83-2, Tempo 6484-52-2,
Ammonium nitrate, uses 7757-79-1, Potassium nitrate, uses
7758-09-0, Potassium nitrite 7789-18-6,
Cesium nitrate 7790-69-4, Lithium nitrate 10022-31-8, Barium
nitrate 13446-48-5, Ammonium nitrite
13454-83-6, Cesium nitrite
13568-33-7, Lithium nitrite 25154-54-5,
DiNitrobenzene 25321-14-6, DiNitrotoluene 25322-01-4, Nitropropane
33454-82-9, Lithium triflate 56778-64-4, Nitropyridine
90076-65-6 143314-14-1, 1-Ethyl-3-methylimidazolium nitrate
RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD
(2 CITINGS)

REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 5 OF 6 HCAPLUS COPYRIGHT 2010 ACS ON STN
ACCESSION NUMBER: 2005:588319 HCAPLUS Full-text
DOCUMENT NUMBER: 143:100355
TITLE: Electrolytes for lithium sulfur batteries
INVENTOR(S): Mikhaylik, Yuriy V.
PATENT ASSIGNEE(S): Moltech Corp., USA; Sion Power Corporation
SOURCE: U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050147891	A1	20050707	US 2004-752876	20040106
US 7354680	B2	20080408		
CA 2552563	A1	20050728	CA 2005-2552563	20050106
WO 2005069404	A2	20050728	WO 2005-US493	20050106
WO 2005069404	A3	20060615		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,

GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
 LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
 NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
 TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, SM
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
 AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
 EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT,
 RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML,
 MR, NE, SN, TD, TG

EP 1726052 A2 20061129 EP 2005-705253 20050106
 R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,
 IS, IT, LI, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA,
 HR, LV, MK, YU
 CN 1930710 A 20070314 CN 2005-80006959 20050106
 JP 2007518229 T 20070705 JP 2006-547630 20050106
 KR 2006125852 A 20061206 KR 2006-715870 20060804
 US 20070082270 A1 20070412 US 2006-585495 20061030
 US 20080187840 A1 20080807 US 2008-99107 20080407
 US 7553590 B2 20090630
 US 20080193835 A1 20080814 US 2008-106079 20080418
 US 2004-752876 A 20040106
 WO 2005-US493 W 20050106
 US 2008-99107 A2 20080407

PRIORITY APPLN. INFO.:

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB Disclosed is an additive for an electrochem. cell wherein the additive
 includes an N-O bond. The additive is most preferably included in a nonaq.
 electrolyte of the cell. Also disclosed are cells and batteries including the
 additive, and methods of charging the batteries and cells. An electrochem.
 cell including the additive preferably has an anode that includes lithium and
 a cathode including an electroactive sulfur-containing material.
 IT 7439-93-2, Lithium, uses 7439-93-2D,
 Lithium, salt
 RL: DEV (Device component use); USES (Uses)
 (electrolytes for lithium sulfur batteries)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

Li

IT 7758-09-0, Potassium nitrite
 13446-48-5, Ammonium nitrite
 13454-83-6, Cesium nitrite
 13568-33-7, Lithium nitrite
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolytes for lithium sulfur batteries)
 RN 7758-09-0 HCAPLUS
 CN Nitrous acid, potassium salt (1:1) (CA INDEX NAME)

$\text{O}=\text{N}-\text{OH}$

● K

RN 13446-48-5 HCAPLUS

CN Nitrous acid, ammonium salt (1:1) (CA INDEX NAME)

 $\text{O}=\text{N}-\text{OH}$

● NH3

RN 13454-83-6 HCAPLUS

CN Nitrous acid, cesium salt (8CI, 9CI) (CA INDEX NAME)

 $\text{O}=\text{N}-\text{OH}$

● Cs

RN 13568-33-7 HCAPLUS

CN Nitrous acid, lithium salt (1:1) (CA INDEX NAME)

 $\text{O}=\text{N}-\text{OH}$

● Li

IC ICM H01M010-40

ICS H01M004-58

INCL 429326000; X42-933.9; X42-921.81; X42-923.195; X42-932.9; X42-934.0

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrolyte lithium sulfur battery

IT Ethers, uses

RL: DEV (Device component use); USES (Uses)

(cyclic; electrolytes for lithium sulfur batteries)

IT Battery cathodes

Battery electrolytes

(electrolytes for lithium sulfur batteries)

IT Ethers, uses

Polyethers, uses

Sulfones

RL: DEV (Device component use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Nitrates, uses

RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Nitrites

RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT Secondary batteries

(lithium; electrolytes for lithium sulfur batteries)

IT Nitro compounds

RL: MOA (Modifier or additive use); USES (Uses)
(organic; electrolytes for lithium sulfur batteries)

IT 96-47-9, 2-Methyltetrahydrofuran 109-87-5, Dimethoxymethane 109-99-9, Thf, uses 110-71-4 111-96-6, Diethylene glycol dimethyl ether 112-49-2, Triethylene glycol dimethyl ether 123-91-1, 1,4-Dioxane, uses 142-68-7, Tetrahydropyran 143-24-8, Tetraethylene glycol dimethyl ether 149-73-5, Trimethoxymethane 505-22-6, 1,3-Dioxane 556-65-0, Lithium thiocyanate 646-06-0, 1,3-Dioxolane 7439-93-2, Lithium, uses 7439-93-2D, Lithium, salt 7704-34-9, Sulfur, uses 17081-21-9, 1,3-Dimethoxypropane 33454-82-9, Lithium triflate 73506-93-1, Diethoxyethane 90076-65-6 11109-77-4, Dipropylene glycol dimethyl ether

RL: DEV (Device component use); USES (Uses)
(electrolytes for lithium sulfur batteries)

IT 75-52-5, Nitromethane, uses 77-79-2, 3-Sulfolene 98-95-3, Nitrobenzene, uses 108-03-2, 1-Nitropropane 126-33-0, Sulfolene 506-93-4, Guanidinium nitrate 610-39-9, 3,4-Dinitrotoluene 872-93-5, 3-Methylsulfolene 1321-12-6, Nitrotoluene 2564-83-2, Tempo 6484-52-2, Ammonium nitrate, uses 7757-79-1, Potassium nitrate, uses 7758-09-0, Potassium nitrite 7789-18-6, Cesium nitrate 7790-69-4, Lithium nitrate 10022-31-8, Barium nitrate 13446-48-5, Ammonium nitrite 13454-83-6, Cesium nitrite 13568-33-7, Lithium nitrite 25154-54-5, DiNitrobenzene 25321-14-6, DiNitrotoluene 25322-01-4, Nitropropane 56778-64-4, Nitropyridine 143314-14-1, 1-Ethyl-3-methylimidazolium nitrate

RL: MOA (Modifier or additive use); USES (Uses)
(electrolytes for lithium sulfur batteries)

OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 6 OF 6 HCAPLUS COPYRIGHT 2010 ACS ON STN

ACCESSION NUMBER: 2002:916834 HCAPLUS Full-text

DOCUMENT NUMBER: 138:224093

TITLE: Electrode characteristics of manganese oxides prepared by reduction method

AUTHOR(S): Yagi, H.; Ichikawa, T.; Hirano, A.; Imanishi, N.; Ogawa, S.; Takeda, Y.

CORPORATE SOURCE: Department of Chemistry, Mie University, Mie, Tsu, 514-8507, Japan

SOURCE: Solid State Ionics (2002), 154-155, 273-278

CODEN: SSIO33; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal
 LANGUAGE: English

- AB The electrode properties of manganese dioxides prepared by the reduction with various reagents were examined. The particle size and morphol. depended on reducing agents. Some samples obtained were aggregated round particles of submicron order and the others were fine needle-like shape of a few nanometers in width and several tens of nanometers in length. The former showed capacity .apprx.200 mA-h/g, while the latter showed high capacity of 500 mA-h/g for open-circuit voltage measurements until 1 V (vs. Li). The cell assembled with Li anode showed a good cycle performance in the range of 2.0-3.9 V with a capacity of 150 mA-h/g.
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST manganese dioxide prepn reducing agent; cathode manganese dioxide lithium battery
- IT Secondary batteries
 (lithium-manganese dioxide; cathode characteristics of manganese dioxides prepared by reduction of potassium permanganate with various reagents for batteries)
- IT 64-18-6, Formic acid, processes 141-53-7, Sodium formate 7631-90-5, Sodium bisulfite 7632-00-0, Sodium nitrite 7681-53-0, Sodium hydrogen phosphite (NaH2PO2) 7722-84-1, Hydrogen peroxide, processes 7757-83-7, Sodium sulfite 7758-09-0, Potassium nitrite 7782-77-6, Nitrous acid 10117-38-1, Potassium sulfite 13598-36-2, Phosphonic acid
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
 (reducing agent; cathode characteristics of manganese dioxides prepared by reduction of potassium permanganate with various reagents for batteries)
- OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)
- REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

***** QUERY RESULTS IV *****
(CLAIM 16)

=> d his 163

(FILE 'HCAPLUS' ENTERED AT 11:31:41 ON 03 MAR 2010)

L63 4 S L62 NOT L51
SAVE TEMP L63 WEI496HCAP4/A

FILE 'STNGUIDE' ENTERED AT 11:41:32 ON 03 MAR 2010

=> d que 163

L2 QUE ABB=ON PLU=ON NEGATIVE? (A) (ACTIVE? OR ELECTRODE)
OR CATHODE

L3 QUE ABB=ON PLU=ON POSITIVE? (A) (ACTIVE? OR ELECTRODE)
OR ANODE

L4 QUE ABB=ON PLU=ON SULFO? OR SULFA? OR SULFI? OR SULPHO
? OR SULPHA? OR SULPHI?

L5 QUE ABB=ON PLU=ON SULFUR? OR SULPHUR?

L6 QUE ABB=ON PLU=ON CONTAIN? OR MATERIAL? OR COMPOUND? O
R SUBSTANC? OR ELEMENT? OR AGENT?

L7 QUE ABB=ON PLU=ON ELECTROACTIV? OR ELECTRO#(W)ACTIV?

L9 QUE ABB=ON PLU=ON LI OR LITHIUM

L10 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN

L11 28386 SEA FILE=HCAPLUS ABB=ON PLU=ON L10 (L) (DEV OR USES)/RL

L12 4390 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 (3A) (L4 OR L5)

L13 330724 SEA FILE=HCAPLUS ABB=ON PLU=ON (L6 OR L7) (3A) (L4 OR L5)

L14 32858 SEA FILE=HCAPLUS ABB=ON PLU=ON L3 (3A) (L9 OR L11)

L17 1664 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND L13

L18 436 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND L14

L19 QUE ABB=ON PLU=ON ADDITIVE? OR ADJUVANT? OR AUXILIAR?
OR MODIF? OR AGENT? OR MEDIUM?

L20 QUE ABB=ON PLU=ON SOLVENT#

L21 QUE ABB=ON PLU=ON ETHER# OR CYCLIC (2A) ETHER# OR POLY
ETHER# OR SULFON?

L22 89 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND L19

L24 138 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND (L20 OR L21)

L26 406800 SEA FILE=HCAPLUS ABB=ON PLU=ON (L4 OR L5) (5A) L6

L27 195 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 OR L24) AND L26

L28 QUE ABB=ON PLU=ON NITRATE#

L29 QUE ABB=ON PLU=ON NITRITE#

L30 QUE ABB=ON PLU=ON NITRO?

L31 22 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND ((L28 OR L29 OR L30))

L32 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7790-69-4/RN

L33 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7757-79-1/RN

L34 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7789-18-6/RN

L35 1 SEA FILE=REGISTRY ABB=ON PLU=ON 10022-31-8/RN

L36 1 SEA FILE=REGISTRY ABB=ON PLU=ON 6484-52-2/RN

L37 21493 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L32 OR L33 OR L34 OR L35 OR
L36)) (L) (MOA OR USES)/RL

L38 54408 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
CESIUM OR BARIUM OR AMMONIUM) (W) NITRATE

L39 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L37

L40 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L38

L41 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L39 OR L40

L43 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13568-33-7/RN

L44 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7758-09-0/RN

L45 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13454-83-6/RN

L46 1 SEA FILE=REGISTRY ABB=ON PLU=ON 13446-48-5/RN

L47 882 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L43 OR L44 OR L45 OR L46))
 (L) (MOA OR USES)/RL
 L48 3119 SEA FILE=HCAPLUS ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR
 CESIUM OR AMMONIUM) (W) NITRITE
 L49 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND (L47 OR L48)
 L51 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L41 NOT L49
 L53 1 SEA FILE=REGISTRY ABB=ON PLU=ON 556-65-0/RN
 L54 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7790-69-4/RN
 L55 1 SEA FILE=REGISTRY ABB=ON PLU=ON 33454-82-9/RN
 L56 804 SEA FILE=HCAPLUS ABB=ON PLU=ON LITHIUM THIOCYANATE OR LISCN
 L57 5507 SEA FILE=HCAPLUS ABB=ON PLU=ON LITHIUM NITRATE
 L58 22 SEA FILE=HCAPLUS ABB=ON PLU=ON LITHIUM TRIFLUOROMETHANESULFON
 IMIDE
 L59 5299 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L53 OR L54 OR L55)) (L)
 (MOA OR USES)/RL
 L60 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND ((L56 OR L57 OR L58
 OR L59))
 L61 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L60 NOT L41
 L62 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L61 NOT L49
 L63 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L62 NOT L51

=> d 163 1-4 ibib abs hitstr hitind

L63 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 2007:1278662 HCAPLUS Full-text
 DOCUMENT NUMBER: 147:505493
 TITLE: Anion receptor comprising aromatic amines substituted
 with electron withdrawing groups and electrolyte using
 the same for alkali metal batteries
 INVENTOR(S): Kim, Hee Jung; Lee, Won Sil
 PATENT ASSIGNEE(S): Kyungwon Enterprise Co., Ltd., S. Korea
 SOURCE: PCT Int. Appl., 63pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007126262	A1	20071108	WO 2007-KR2080	20070427
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RM: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, GL, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				

PRIORITY APPLN. INFO.: KR 2006-38047 A 20060427
 OTHER SOURCE(S): CASREACT 147:505493; MARPAT 147:505493

AB Disclosed is a novel anion receptor and electrolytes containing the same. A novel anion receptor is an aromatic hydrocarbon compound having an amine substituted with electron withdrawing groups. When the anion receptor is added to the electrolyte, ionic conductivity and cation transference number of

electrolytes are enhanced, thereby increasing the electrochem. stability of alkali metal batteries using the electrolytes. Thus, sulfonylation of 4-hexylaniline with triflic anhydride afforded the anionic receptor 4-[H(CH₂)₆]C₆H₄N(SO₂CF₃)₂ (4-hexylphenyl-TFSI); the latter was mixed with 0.8 g bisphenol A ethoxylate dimethacrylate (crosslinking agent) and lithium triflate and to this mixture was subsequently added dimethoxyphenylacetophenone and the resulting solution coated onto a conductive glass substrate and exposed to UV irradiation, forming the solid polymer electrolyte. The ionic conductivity of the solid polymer electrolyte containing 4-hexylphenyl-TFSI as anion receptor exceeded the comparative electrolyte without anion receptor as temperature increased.

IT 33454-82-9, Lithium triflate
 RL: MOA (Modifier or additive use); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 RN 33454-82-9 HCAPLUS
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IT 7439-93-2DE, Lithium, polymer electrolyte complexes
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

Li

IT 7439-93-2, Lithium, uses 7439-93-2D,
 Lithium, intercalation compds. with carbon
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)
 RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

Li

RN 7439-93-2 HCAPLUS
 CN Lithium (CA INDEX NAME)

LI

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Secondary batteries
 (lithium; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT Lithium alloy, base
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 87187-79-9, Lithium pentafluoropropanoate 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132404-42-3, Lithium tris(trifluoromethanesulfonyl)methanide
 RL: MOA (Modifier or additive use); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 64696-13-5DP, Bisphenol A ethoxylate dimethacrylate homopolymer, lithium complexes, trifluoromethanesulfonimide-containing
 RL: POF (Polymer in formulation); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 7439-93-2DP, Lithium, polymer electrolyte complexes
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compds. with carbon 7440-44-0D, Carbon, intercalation compds. with lithium 7782-42-5, Graphite, uses 7782-42-5D, Graphite, intercalation compds. with lithium
 RL: TEM (Technical or engineered material use); USES (Uses)
 (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-79-7, Lithium manganese oxide (LiMnO₂) 12190-79-3, Cobalt lithium oxide (LiCoO₂) 12201-18-2, Lithium molybdenum sulfide (LiMoS₂) 55326-82-4, Lithium titanium sulfide

- (LiTiS₂) 135573-53-4, Cobalt lithium nickel oxide
 (Co₀-1LiNi₀-1O₂) 138187-48-1, Lithium vanadium oxide
 (Li₁.2V₂O₅) 252234-58-5, Lithium magnesium nickel oxide
 (LiMg₀-1Ni₀-1O₂) 252234-59-6, Aluminum lithium nickel oxide
 (Al₀-1LiNi₀-1O₂) 256345-13-8, Lithium vanadium oxide
 (Li₂.5V₆O₁₃) 600177-48-8, Lithium nickel titanium oxide
 (LiNi₀-1Ti₀-1O₂) 911110-65-1, Lithium niobium selenide
 (LiNbSe₃)
- RL: TEM (Technical or engineered material use); USES (Uses)
 (cathode; anion receptor comprising aromatic amines substituted
 with electron withdrawing groups and electrolyte using the same for
 alkali metal batteries)
- IT 128-09-6, N-Chlorosuccinimide
- RL: RCT (Reactant); RACT (Reactant or reagent)
 (chlorination agent; anion receptor comprising aromatic amines
 substituted with electron withdrawing groups and electrolyte using the
 same for alkali metal batteries)
- IT 506-77-4, Cyanogen chloride
- RL: RCT (Reactant); RACT (Reactant or reagent)
 (cyanation agent; anion receptor comprising aromatic amines
 substituted with electron withdrawing groups and electrolyte using the
 same for alkali metal batteries)
- IT 5339-26-4P, 1-(2-Bromoethyl)-4-nitrobenzene
- RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (dehydrobromination; anion receptor comprising aromatic amines substituted
 with electron withdrawing groups and electrolyte using the same for
 alkali metal batteries)
- IT 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,
 γ-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl
 carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate
 109-87-5, Dimethoxymethane 109-99-9, THF, uses 110-71-4,
 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate
 646-06-0, 1,3-Dioxolane 872-50-4, N-Methyl-2-pyrrolidinone, uses
 1072-47-5, 4-Methyl-1,3-dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone
 51667-26-6, Oxazolidinone
- RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. solvent; anion receptor comprising aromatic amines
 substituted with electron withdrawing groups and electrolyte using the
 same for alkali metal batteries)
- IT 84-65-1, Anthraquinone 90-94-8, Michler's ketone 93-97-0, Benzoyl
 benzoate 119-61-9, Benzophenone, uses 120-51-4, Benzyl benzoate
 134-85-0, p-Chlorobenzophenone 492-22-8, Thioxanthone 574-09-4, Ethyl
 benzoate 927-07-1, tert-Butyl peroxyphthalate 947-19-3,
 1-Hydroxycyclohexyl phenyl ketone 2648-61-5,
 α,α-Dichloroacetophenone 6175-45-7,
 α,α-Diethoxyacetophenone 6652-28-4, Isopropyl benzoin
 ether 6652-29-5, Benzoin phenyl ether 7473-98-5,
 2-Hydroxy-2-methyl-1-phenyl-1-propanone 24650-42-8, DMPA 27962-49-8,
 α-Methylbenzoin ethyl ether 72896-34-5,
 Chlorothioxanthone 75081-21-9, (Isopropyl)thioxanthone
- RL: CAT (Catalyst use); USES (Uses)
 (photocuring initiator for polymer electrolyte; anion receptor
 comprising aromatic amines substituted with electron withdrawing groups
 and electrolyte using the same for alkali metal batteries)
- IT 9003-11-6D, Ethylene glycol propylene glycol copolymer, di-Bu
 ether-terminated 24991-55-7, Polyethylene glycol dimethyl
 ether 24991-61-5, Polypropylene glycol dimethyl ether
 26142-30-3, Polypropylene glycol diglycidyl ether 26403-72-5,

Polyethylene glycol diglycidyl ether 31885-97-9, Polyethylene glycol dibutyl ether 53609-62-4, Polyethylene glycol diethyl ether 60314-50-3, Polyethylene glycol dipropyl ether 106392-12-5D, Block polyethylene-polypropylene glycol, di-Bu ether -terminated

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(polymer electrolyte; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 100-13-0P, 4-Nitrostyrene 13556-15-5P, 1,3,5-Triazidobenzene

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 124-63-0, Methanesulfonyl chloride 358-23-6, Triflic anhydride

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfonylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 96-50-4, 2-Aminothiazole 109-12-6, 2-Aminopyrimidine 141-86-6, 2,6-Diaminopyridine 328-74-5, 3,5-Bis(trifluoromethyl)aniline

670-96-2, 2-Phenylimidazole 7673-09-8 31230-17-8, 3-Amino-5-methylpyrazole 33228-45-4, 4-Hexylaniline

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 108-72-5P, 1,3,5-Triaminobenzene 1520-21-4P, 4-Aminostyrene

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 108-73-6, 1,3,5-Benzenetriol

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfonylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

IT 68602-57-3, Trifluoroacetyl trifluoromethanesulfonyl anhydride

RL: RCT (Reactant); RACT (Reactant or reagent)

(trifluoroacetylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and electrolyte using the same for alkali metal batteries)

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L63 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2010 ACS ON STN

ACCESSION NUMBER: 2004:119840 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:149223

TITLE: Method for producing cathode for lithium-sulfur battery

INVENTOR(S): Hwang, Duck-chul; Park, Zin; Lee, Jae-woan

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 11 pp.

DOCUMENT TYPE: CODEN: USXXCO
 LANGUAGE: Patent
 FAMILY ACC. NUM. COUNT: 1 English
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040029014	A1	20040212	US 2003-634748	20030806
KR 2004013585	A	20040214	KR 2002-46581	20020807
JP 2004071566	A	20040304	JP 2003-283959	20030731
CN 1495937	A	20040512	CN 2003-127272	20030807
CN 1331252	C	20070808		

PRIORITY APPLN. INFO.: KR 2002-46581 A 20020807

AB The invention concerns a pos. electrode of a lithium-sulfur battery, a method of producing the same, and a lithium-sulfur battery include, as the pos. electrode, a current collector, a pos. active material layer on the current collector, and a polymer layer on the pos. active material on the current collector.

IT 7439-93-2, Lithium, uses 33454-82-9,

Lithium triflate

RL: DEV (Device component use); USES (Uses)

(method for producing cathode for lithium-sulfur battery)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

Li

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M002-16

ICS H01M004-60; H01M004-58

INCL 429246000; 429251000; 429252000; 429218100; 429213000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

ST cathode lithium sulfur battery

IT Polyurethanes, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(acrylates, ethoxylated; method for producing cathode for lithium-sulfur battery)

IT Styrene-butadiene rubber, uses

- RL: DEV (Device component use); USES (Uses)
(hydrogenated, block, triblock, sulfonated; method for producing cathode for lithium-sulfur battery)
- IT Primary batteries
(lithium; method for producing cathode for lithium-sulfur battery)
- IT Battery cathodes
(method for producing cathode for lithium-sulfur battery)
- IT ABS rubber
Fluoropolymers, uses
Nitrile rubber, uses
Polyolefins
Polyoxyalkylenes, uses
Polyvinyl butyrals
Styrene-butadiene rubber, uses
RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-sulfur battery)
- IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-sulfur battery)
- IT 9003-56-9
RL: DEV (Device component use); USES (Uses)
(ABS rubber, method for producing cathode for lithium-sulfur battery)
- IT 1344-28-1, Alumina, uses 7631-86-9, Colloidal silica, uses
RL: DEV (Device component use); USES (Uses)
(colloidal; method for producing cathode for lithium-sulfur battery)
- IT 10344-93-1D, Acrylate, alkyl derivative
RL: TEM (Technical or engineered material use); USES (Uses)
(ethoxylated; method for producing cathode for lithium-sulfur battery)
- IT 110-71-4 111-96-6, Diglyme 126-33-0, Sulfolane 646-06-0, 1,3-Dioxolane 1314-23-4, Zirconium oxide, uses 1332-29-2, Tin oxide 1332-37-2, Iron oxide, uses 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl ether 9003-20-7, Polyvinyl acetate 9003-22-9, Vinyl acetate-vinyl chloride copolymer 9003-39-8, Polyvinylpyrrolidone 9004-35-7, Cellulose acetate 9010-88-2, Ethyl acrylate-methylmethacrylate copolymer 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 11075-35-7, Vanadium titanium oxide 11099-11-9, Vanadium oxide 11126-12-8, Iron sulfide 12673-92-6, Titanium sulfide 12789-64-9, Iron titanate 13463-67-7, Titanium oxide, uses 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 24937-79-9, PVDF 25014-41-9, Polyacrylonitrile 25086-89-9, Vinyl acetate-vinylpyrrolidone copolymer 25322-68-3, Pco 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 69822-67-9, Poly(carbon sulfide) 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide 130038-50-5, 2-Propenoic acid, 2-methyl-, ion(1-) homopolymer, uses 413569-08-1, 2-Propenoic acid, ion(1-) homopolymer, uses
RL: DEV (Device component use); USES (Uses)
(method for producing cathode for lithium-

- sulfur battery)
- IT 7439-95-4, Magnesium, uses 7440-21-3, Silicon, uses 7440-24-6, Strontium, uses 7440-28-0, Thallium, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-56-4, Germanium, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7553-56-2, Iodine, uses 7726-95-6, Bromine, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (method for producing cathode for lithium-sulfur battery)
- IT 9003-18-3
 RL: DEV (Device component use); USES (Uses)
 (nitrile rubber, method for producing cathode for lithium-sulfur battery)
- IT 64401-02-1 84170-28-5
 RL: TEM (Technical or engineered material use); USES (Uses)
 (protective coating containing; method for producing cathode for lithium-sulfur battery)
- IT 7429-90-5, Aluminum, uses 7440-39-3, Barium, uses 7440-42-8, Boron, uses 7723-14-0, Phosphorus, uses 7727-37-9, Nitrogen, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses 7782-50-5, Chlorine, uses 26570-48-9, Polyethylene glycol diacrylate 52496-08-9, Polypropylene glycol diacrylate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (protective coating; method for producing cathode for lithium-sulfur battery)
- IT 106107-54-4
 RL: DEV (Device component use); USES (Uses)
 (styrene-butadiene rubber, hydrogenated, block, triblock, sulfonated; method for producing cathode for lithium-sulfur battery)
- IT 9003-55-8
 RL: DEV (Device component use); USES (Uses)
 (styrene-butadiene rubber, method for producing cathode for lithium-sulfur battery)
- IT 694491-73-1D, hydrogenated, block, triblock
 RL: DEV (Device component use); USES (Uses)
 (styrene-butadiene rubber, sulfonated; method for producing cathode for lithium-sulfur battery)

L63 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2002:964986 HCAPLUS Full-text

DOCUMENT NUMBER: 138:15307

TITLE: Lithium-sulfur batteries with good cycle life characteristics

INVENTOR(S): Choi, Soo Seok; Choi, Yunsuk; Jung, Yongju; Lee, Jaewoan; Hwang, Duck Chul; Kim, Joo Soak; Park, Zin; Kim, Seok; Han, Ji Sung

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 16 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20020192557	A1	20021219	US 2002-72907	20020212
US 7250233	B2	20070731		
KR 2002092029	A	20021211	KR 2001-30878	20010601

10/585496

JP 2002367678	A	20021220	JP 2002-61349	20020307
CN 1389948	A	20030108	CN 2002-116133	20020419
CN 100346523	C	20071031		

PRIORITY APPLN. INFO.: KR 2001-30878 A 20010601

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB A lithium-sulfur battery having a pos. electrode including a pos. active material including an active sulfur, where the pos. electrode comprises an electron-conductive path and an ion-conductive path, and includes active pores of the average size of up to 20 μm having both electron-conductive and ion-conductive properties, and are filled with the active sulfur during an electrochem. reaction of the battery.

IT 7439-93-2, Lithium, uses 33454-82-9, Lithium triflate
 RL: DEV (Device component use); USES (Uses)
 (lithium-sulfur batteries with good cycle life characteristics)

RN 7439-93-2 HCAPLUS

CN Lithium (CA INDEX NAME)

L1

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M004-62

INCL 429232000; 429231950; 429218100; 429212000; 427058000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium sulfur rechargeable battery

IT Fluoropolymers, uses
 Polyoxyalkylenes, uses
 Polyvinyl butyrals
 RL: MOA (Modifier or additive use); USES (Uses)
 (binder; lithium-sulfur batteries with good cycle life characteristics)

IT Ceramics
 (electrolyte; lithium-sulfur batteries with good cycle life characteristics)

IT Glass, uses
 RL: DEV (Device component use); USES (Uses)
 (electrolyte; lithium-sulfur batteries with good cycle life characteristics)

IT Battery anodes

Battery cathodes

- Battery electrolytes
Polymer electrolytes
(lithium-sulfur batteries with good cycle life characteristics)
- IT Crown ethers
Sulfones
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT Secondary batteries
(lithium; lithium-sulfur batteries with good cycle life characteristics)
- IT Lignroine
RL: DEV (Device component use); USES (Uses)
(solvent; lithium-sulfur batteries with good cycle life characteristics)
- IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 9002-84-0, Ptfе 9002-86-2, Polyvinyl chloride 9002-89-5, Polyvinyl alcohol 9003-19-4, Polyvinyl ether 9003-20-7, Polyvinyl acetate 9003-22-9, Vinyl acetate-vinyl chloride copolymer 9003-32-1, Polyethyl acrylate 9003-47-8, Polyvinylpyridine 9003-53-6, Polystyrene 9004-35-7, Cellulose acetate 9010-88-2, Ethyl acrylate-methyl methacrylate copolymer 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Polyvinylidene fluoride 25014-41-9, Polyacrylonitrile 25086-89-9 25322-68-3, Pco
RL: MOA (Modifier or additive use); USES (Uses)
(binder; lithium-sulfur batteries with good cycle life characteristics)
- IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 33454-82-9, Lithium triflate
RL: DEV (Device component use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 115672-18-9P, Lithium sulfide (Li₂S(S))
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 67-68-5, Dmsо, uses 67-71-0, Dimethyl sulfone 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 96-48-0, Butyrolactone 107-21-1, Ethylene glycol, uses 109-99-9, Thf, uses 110-60-1, Tetramethylene diamine 110-71-4, Glyme 110-86-1, Pyridine, uses 110-95-2, Tetramethyl propylene diamine 111-96-6, Diglyme 126-33-0, Sulfolane 126-73-8, Tributyl phosphate, uses 127-19-5, n,n-Dimethyl acetamide 143-24-8, Tetraglyme 512-56-1, Trimethyl phosphate 617-84-5, n,n-Diethylformamide 632-22-4, Tetramethyl urea 646-06-0, Dioxolane 680-31-9, Hexamethylphosphoramide, uses 685-91-6, n,n-Diethyl acetamide 872-50-4, n-Methylpyrrolidone, uses 1330-20-7, Xylene, uses 1493-13-6, Trifluoromethanesulfonic acid 2832-49-7, n,n,n',n'-Tetraethyl sulfamide 7446-09-5, Sulfur dioxide, uses 7637-07-2, uses 9080-49-3, Polysulfide
RL: MOA (Modifier or additive use); USES (Uses)
(lithium-sulfur batteries with good cycle life characteristics)
- IT 78-51-3 84-66-2, Diethyl phthalate 84-74-2, Dibutyl phthalate 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 131-11-3,

Dimethyl phthalate 2459-10-1, Trimethyl trimellitate
 RL: MOA (Modifier or additive use); USES (Uses)
 (plasticizer; lithium-sulfur batteries with good cycle life characteristics)

IT 60-29-7, Ether, uses 64-17-5, Ethanol, uses 67-56-1,
 Methanol, uses 71-55-6, Trichloroethane 75-09-2, Dichloromethane, uses
 79-01-6, Trichloroethylene, uses 110-54-3, Hexane, uses 110-82-7,
 Cyclohexane, uses
 RL: DEV (Device component use); USES (Uses)
 (solvent; lithium-sulfur batteries with good cycle life characteristics)

OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD
 (5 CITINGS)

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L63 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2010 ACS ON STN

ACCESSION NUMBER: 1993:584774 HCAPLUS Full-text

DOCUMENT NUMBER: 119:184774

ORIGINAL REFERENCE NO.: 119:32955a, 32958a

TITLE: Lithium secondary battery

INVENTOR(S): Fujimoto, Masahisa; Yoshinaga, Noriyuki; Ueno, Koji;
 Furukawa, Nobuhiro; Nohma, Toshiyuki; Takahashi,
 Masatoshi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Eur. Pat. Appl., 60 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 541889	A1	19930519	EP 1992-103986	19920309
EP 541889	B1	19980909		
R: CH, DE, FR, GB, LI				
JP 05013088	A	19930122	JP 1991-325778	19911210
JP 3369583	B2	20030120		
JP 11224675	A	19990817	JP 1998-340492	19911210
JP 05211070	A	19930820	JP 1991-360254	19911227
JP 3229635	B2	20011119		
JP 2002075451	A	20020315	JP 2001-213908	19911227
JP 3403184	B2	20030506		
JP 2002075452	A	20020315	JP 2001-213909	19911227
JP 3408250	B2	20030519		
CA 2064965	A1	19930513	CA 1992-2064965	19920402
CA 2064965	C	19970603		
JP 2002075448	A	20020315	JP 2001-213905	20010713
JP 3374135	B2	20030204		
JP 2002075449	A	20020315	JP 2001-213906	20010713
JP 3374136	B2	20030204		
JP 2002075450	A	20020315	JP 2001-213907	20010713
JP 3374137	B2	20030204		

PRIORITY APPLN. INFO.:
 JP 1991-295835 A 19911112
 JP 1991-319200 A 19911203
 JP 1991-325778 A 19911210
 JP 1991-360254 A 19911227
 JP 1990-401667 A1 19901212

- AB The battery includes a cathode of a Li-intercalatable compound, an anode of a carbonaceous material comprising mainly or only graphite, a separator, and an electrolyte of a Li salt in a solvent comprising ≥ 1 cyclic compound such as ethylene carbonate, ethylene thiocarbonate, γ -thiobutyrolactone, α -pyrrolidone, γ -butyrolactone, propylene carbonate, 1,2-butylene carbonate, etc. The graphite has an average particle diameter 1-30 μm , spacing of (002) planes 3.35-3.40 \AA , crystallite size in c direction ≥ 150 \AA , sp. surface area 0.5-50 m^2/g , and true d. 1.9-2.3 g/cm^3 . The Li-intercalatable compound is Li_xMO_2 or $\text{Li}_y\text{M}_2\text{O}_4$, where M is a transition element, $x \leq 1$ and $y \leq 2$; metal oxide-, anion-, or halide-intercalated graphite; or a conductive polymer containing a dopant.
- IT 33454-82-9, Lithium trifluoromethanesulfonate
 RL: USES (Uses)
 (electrolyte containing, for high-performance and long cycle-life lithium batteries)
- RN 33454-82-9 HCAPLUS
- CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

- IC ICM H01M004-58
 ICS H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
- ST lithium battery electrolyte solvent; electrolyte org
 lithium battery; graphite anode lithium
 battery; anode graphite lithium battery; transition
 metal lithium oxide cathode; polymer lithium
 intercalatable battery cathode
- IT Battery electrolytes
 (lithium salt in at least one cyclic organic compound)
- IT Batteries, secondary
 (lithium, high-performance and long cycle-life)
- IT Carbon fibers, compounds
 RL: USES (Uses)
 (graphite, intercalation compds., with nitrate or
 sulfate, lithium-intercalatable, cathodes,
 in high-performance organic-electrolyte lithium batteries)
- IT 7782-42-5, Graphite, uses
 RL: USES (Uses)
 (anodes, in high-performance organic-electrolyte lithium
 batteries)
- IT 7440-44-0 7782-42-5
 RL: USES (Uses)
 (carbon fibers, graphite, intercalation compds., with
 nitrate or sulfate, lithium-intercalatable,
 cathodes, in high-performance organic-electrolyte lithium
 batteries)
- IT 12031-65-1, Lithium nickel oxide (LiNiO_2) 12057-17-9,

- Lithium manganese oxide (LiMn2O4) 12162-87-7D, Lithium vanadium oxide (LiVO2), graphite intercalated with 12190-79-3, Cobalt lithium oxide (CoLiO2) 15060-59-0D, Lithium vanadium oxide (LiVO3), graphite intercalated with 118321-27-0D, Lithium molybdenum oxide (Li0.3MoO3), graphite intercalated with
- RL: USES (Uses)
(cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 25233-30-1, Polyaniline 25233-34-5, Polythiophene 25718-66-5
30604-81-0, Polypyrrole 51555-21-6, Polycarbazole
- RL: USES (Uses)
(doped, lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 96-48-0, γ -Butyrolactone 96-49-1, 1,3-Dioxolan-2-one 108-29-2,
 γ -Valerolactone 108-32-7 109-99-9, uses 110-01-0, Thiolane 123-75-1, Pyrrolidine, uses 504-70-1, Pyrazolidine 616-45-5,
 α -Pyrrolidone 695-06-7, γ -Ethyl- γ -butyrolactone
1003-10-7, γ -Thiobutyrolactone 1003-46-9, 2-Methylsulfolane
1679-49-8, β -Methyl- γ -butyrolactone 4437-70-1, 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate 7791-03-9, Lithium perchlorate 10178-59-3 13423-15-9, 3-Methyltetrahydrofuran 14283-07-9, Lithium tetrafluoroborate 20628-59-5, Ethylene thiocarbonate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate 89791-49-1 90076-65-6 131651-65-5
- RL: USES (Uses)
(electrolyte containing, for high-performance and long cycle-life lithium batteries)
- IT 1313-27-5D, Molybdenum oxide (MoO3), graphite intercalated with 1314-35-8D, Tungsten oxide (WO3), graphite intercalated with 1314-62-1D, Vanadium pentoxide, graphite intercalated with 1333-82-0D, Chromium oxide (CrO3), graphite intercalated with 7783-63-3D, graphite intercalated with 11115-86-9, Graphite iron chloride 11129-36-5 12036-21-4D, Vanadium oxide (VO2), graphite intercalated with 12039-13-3D, Titanium disulfide, graphite intercalated with 12067-45-7D, Titanium diselenide, graphite intercalated with 12166-28-8D, Vanadium disulfide, graphite intercalated with 12299-51-3D, Vanadium diselenide, graphite intercalated with 12672-50-3, Graphite cobalt chloride 12707-64-1 14477-72-6D, Trifluoroacetate, graphite intercalated with 14797-73-0D, Perchlorate, graphite intercalated with 14844-07-6D, Dithionite, graphite intercalated with 14874-70-5D, Tetrafluoroborate, graphite intercalated with 16919-18-9D, Hexafluorophosphate, graphite intercalated with 18868-43-4D, Molybdenum oxide (MoO2), graphite intercalated with 37181-39-8D, Trifluoromethanesulfonate, graphite intercalated with 37210-78-9 37348-79-1, Graphite iodine chloride 39345-60-3D, graphite intercalated with 39383-90-9 51358-33-9D, graphite intercalated with 58572-93-3 61008-50-2, Graphite magnesium chloride 61462-06-4, Graphite manganese chloride 61811-49-2, Graphite iodine bromide 63943-01-1D, graphite intercalated with 89172-94-1 89820-60-0 106496-65-5, Molybdenum potassium oxide (MoK0.3O3)
- RL: USES (Uses)
(lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)
- IT 7782-42-5, Graphite, uses
- RL: USES (Uses)
(lithium-intercalatable, cathodes, in high-performance organic-electrolyte lithium batteries)
- OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

=> d his nof

(FILE 'HOME' ENTERED AT 10:33:25 ON 03 MAR 2010)

FILE 'HCAPLUS' ENTERED AT 10:33:38 ON 03 MAR 2010

L1 1 SEA ABB=ON PLU=ON US20070082264/PN
 L2 QUE ABB=ON PLU=ON NEGATIVE? (A) (ACTIVE? OR ELECTRODE) OR
 CATHODE
 L3 QUE ABB=ON PLU=ON POSITIVE? (A) (ACTIVE? OR ELECTRODE) OR
 ANODE
 L4 QUE ABB=ON PLU=ON SULFO? OR SULFA? OR SULFI? OR SULPHO? OR
 SULPHA? OR SULPHI?
 L5 QUE ABB=ON PLU=ON SULFUR? OR SULPHUR?
 L6 QUE ABB=ON PLU=ON CONTAIN? OR MATERIAL? OR COMPOUND? OR
 SUBSTANC? OR ELEMENT? OR AGENT?
 L7 QUE ABB=ON PLU=ON ELECTROACTIV? OR ELECTRO#(W)ACTIV?
 L8 QUE ABB=ON PLU=ON ELECTRON? (2A) ACTIV?
 L9 QUE ABB=ON PLU=ON LI OR LITHIUM

FILE 'REGISTRY' ENTERED AT 10:36:30 ON 03 MAR 2010

L10 1 SEA ABB=ON PLU=ON 7439-93-2/RN
 FILE 'HCAPLUS' ENTERED AT 10:36:41 ON 03 MAR 2010
 L11 28386 SEA ABB=ON PLU=ON L10 (L) (DEV OR USES)/RL
 L12 4390 SEA ABB=ON PLU=ON L2 (3A) (L4 OR L5)
 L13 330724 SEA ABB=ON PLU=ON (L6 OR L7) (3A) (L4 OR L5)
 L14 32858 SEA ABB=ON PLU=ON L3 (3A) (L9 OR L11)
 L15 993 SEA ABB=ON PLU=ON L14 AND L12
 L16 1248 SEA ABB=ON PLU=ON L14 AND L13
 L17 1664 SEA ABB=ON PLU=ON L12 AND L13
 L18 436 SEA ABB=ON PLU=ON L17 AND L14
 L19 QUE ABB=ON PLU=ON ADDITIVE? OR ADJUVANT? OR AUXILIAR? OR
 MODIF? OR AGENT? OR MEDIUM?
 L20 QUE ABB=ON PLU=ON SOLVENT#
 L21 QUE ABB=ON PLU=ON ETHER# OR CYCLIC (2A) ETHER# OR POLYETHER#
 OR SULFON?
 L22 89 SEA ABB=ON PLU=ON L18 AND L19
 L23 0 SEA ABB=ON PLU=ON L1 AND L22
 L24 138 SEA ABB=ON PLU=ON L18 AND (L20 OR L21)
 L25 1 SEA ABB=ON PLU=ON L1 AND L24
 L26 406800 SEA ABB=ON PLU=ON (L4 OR L5) (5A) L6
 L27 195 SEA ABB=ON PLU=ON (L22 OR L24) AND L26
 L28 QUE ABB=ON PLU=ON NITRATE#
 L29 QUE ABB=ON PLU=ON NITRITE#
 L30 QUE ABB=ON PLU=ON NITRO?
 L31 22 SEA ABB=ON PLU=ON L27 AND ((L28 OR L29 OR L30))
 SAVE TEMP L31 WEI496HCAP1/A

FILE 'STNGUIDE' ENTERED AT 11:05:15 ON 03 MAR 2010

FILE 'REGISTRY' ENTERED AT 11:06:50 ON 03 MAR 2010

L32 1 SEA ABB=ON PLU=ON 7790-69-4/RN
 L33 1 SEA ABB=ON PLU=ON 7757-79-1/RN
 L34 1 SEA ABB=ON PLU=ON 7789-18-6/RN
 L35 1 SEA ABB=ON PLU=ON 10022-31-8/RN
 L36 1 SEA ABB=ON PLU=ON 6484-52-2/RN

FILE 'HCAPLUS' ENTERED AT 11:07:51 ON 03 MAR 2010

10/585496

L37 21493 SEA ABB=ON PLU=ON ((L32 OR L33 OR L34 OR L35 OR L36)) (L)
(MOA OR USES)/RL

L38 54408 SEA ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR CESIUM OR BARIUM
OR AMMONIUM) (W) NITRATE

L39 9 SEA ABB=ON PLU=ON L27 AND L37

L40 9 SEA ABB=ON PLU=ON L27 AND L38

L41 9 SEA ABB=ON PLU=ON L39 OR L40

L42 13 SEA ABB=ON PLU=ON L31 NOT L41

FILE 'REGISTRY' ENTERED AT 11:18:09 ON 03 MAR 2010

L43 1 SEA ABB=ON PLU=ON 13568-33-7/RN

L44 1 SEA ABB=ON PLU=ON 7758-09-0/RN

L45 1 SEA ABB=ON PLU=ON 13454-83-6/RN

L46 1 SEA ABB=ON PLU=ON 13446-48-5/RN

FILE 'HCAPLUS' ENTERED AT 11:19:04 ON 03 MAR 2010

L47 882 SEA ABB=ON PLU=ON ((L43 OR L44 OR L45 OR L46)) (L) (MOA OR
USES)/RL

L48 3119 SEA ABB=ON PLU=ON (LITHIUM OR POTASSIUM OR CESIUM OR
AMMONIUM) (W) NITRITE

L49 6 SEA ABB=ON PLU=ON L27 AND (L47 OR L48)

L50 0 SEA ABB=ON PLU=ON L49 NOT (L42 OR L41)

L51 4 SEA ABB=ON PLU=ON L41 NOT L49

L52 12 SEA ABB=ON PLU=ON L42 NOT L49
SAVE TEMP L51 WEI496HCAP2/A
SAVE TEMP L49 WEI496HCAP3/A

FILE 'STNGUIDE' ENTERED AT 11:29:20 ON 03 MAR 2010

FILE 'REGISTRY' ENTERED AT 11:30:38 ON 03 MAR 2010

L53 1 SEA ABB=ON PLU=ON 556-65-0/RN
D CN

L54 1 SEA ABB=ON PLU=ON 7790-69-4/RN

L55 1 SEA ABB=ON PLU=ON 33454-82-9/RN
D CN

FILE 'HCAPLUS' ENTERED AT 11:31:41 ON 03 MAR 2010

L56 804 SEA ABB=ON PLU=ON LITHIUM THIOCYANATE OR LISCN

L57 5507 SEA ABB=ON PLU=ON LITHIUM NITRATE

L58 22 SEA ABB=ON PLU=ON LITHIUM TRIFLUOROMETHANESULFONIMIDE

L59 5299 SEA ABB=ON PLU=ON ((L53 OR L54 OR L55)) (L) (MOA OR USES)/RL

L60 13 SEA ABB=ON PLU=ON L31 AND ((L56 OR L57 OR L58 OR L59))

L61 4 SEA ABB=ON PLU=ON L60 NOT L41

L62 4 SEA ABB=ON PLU=ON L61 NOT L49

L63 4 SEA ABB=ON PLU=ON L62 NOT L51
D SCA TI HIT
SAVE TEMP L63 WEI496HCAP4/A

FILE 'STNGUIDE' ENTERED AT 11:39:16 ON 03 MAR 2010
D QUE L42

FILE 'HCAPLUS' ENTERED AT 11:40:09 ON 03 MAR 2010
D L42 1-13 IBIB ABS HITSTR HITIND

FILE 'STNGUIDE' ENTERED AT 11:40:20 ON 03 MAR 2010
D QUE L51

FILE 'HCAPLUS' ENTERED AT 11:40:53 ON 03 MAR 2010
D L51 1-4 IBIB ABS HITSTR HITIND

10/585496

FILE 'STNGUIDE' ENTERED AT 11:40:55 ON 03 MAR 2010
D QUE L49

FILE 'HCAPLUS' ENTERED AT 11:41:30 ON 03 MAR 2010
D L49 1-6 IBIB ABS HITSTR HITIND

FILE 'STNGUIDE' ENTERED AT 11:41:32 ON 03 MAR 2010
D QUE L63

FILE 'HCAPLUS' ENTERED AT 11:42:23 ON 03 MAR 2010
D L63 1-4 IBIB ABS HITSTR HITIND

FILE 'STNGUIDE' ENTERED AT 11:42:25 ON 03 MAR 2010